BTR

7321 **Development and Contemporary State of Spectrographic Analysis in the USSR.** (In Czech.) Adolf Pokorny. *Hutnické Listy*, v. 7, Feb. 1952, p. 62-64.

Presents a brief outline of the above.

POKERNY, EMINGER

Journal of Applied Chemistry
March 1954
Industrial Inorganic Chemistry

Chromium-tungsten-vanadium steels for steam turbines. E. Eminger, Pokorny, and J. Slajs (*Strojírenství*, 1953, 3, 444–452; *J. Iron Steel Inst.*, 1954, 176, 444).—Tensile, impact, and creep results obtained in long- and short-time tests on several types of Cr–W–V steels, containing 0·05–0·25% of Mo as impurity, are given. Except for a somewhat lower notch impact strength, the steels are practically equivalent to Cr–W–Mo steels conventionally employed for steam turbines. R. B. CLARKE.

POKSAYETSKIY, V.V.

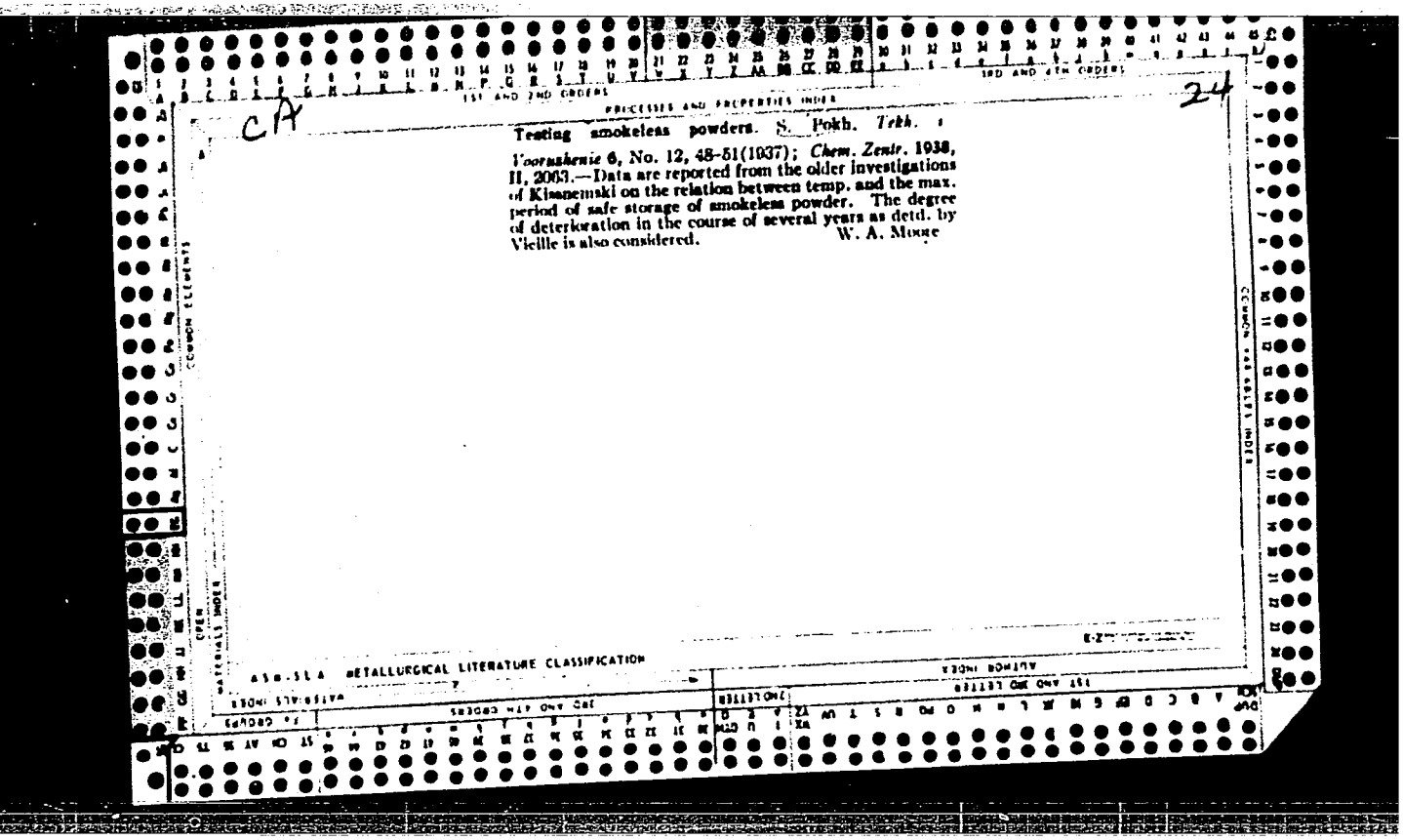
13469 Reactions in Arc Atmosphere During Submerged Automatic Welding. V. V. Pokgaetskii. *Henry Brutcher, Altadena, Calif., Translation no. 3072, 15 p. (From Avtomaticheskaya Svarka, v. 6, no. 1, 1953, p. 10-18.)*
Relationship between weld porosity and reactions in which H forms compounds insoluble in liquid steel and stable at the high arc temperatures. Tables. 27 ref.

AVERCHENKO, V.P., inzh.; KIRPATOVSKIY, G.V., inzh.; POKH, I.Ye., inzh.

Electric power supply of the construction site of the Krasnoyarsk Hydroelectric Power Station. Energ. stroi. no.41:45-54 '64.
(MIRA 17:11)

UMANSKIY, Boris Zinov'yevich; POKH, Il'ya Yefimovich; KHEYFITS, M.E., inzh., red.; LARIONOV, [illegible], tekhn. red.

[Electric power supply for the construction of large hydroelectric power plants] Elektrosnabzhenie stroitel'stva krupnykh gidroelektrostantsii. Pod red. M.E.Kheifitsa. Moskva, Gos. energ. izd-vo, 1961. 271 p. (MIRA 14:9)
(Hydroelectric power stations—Design and construction)
(Electric power distribution)



CA

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PROCESSES AND PROPERTIES INDEX

Testing smokeless powders. S. Pokh. *Tekh.* *Voorukhenie* 6, No. 12, 48–51(1937); *Chem. Zentr.* 1938, II, 2063.—Data are reported from the older investigations of Kissemski on the relation between temp. and the max. period of safe storage of smokeless powder. The degree of deterioration in the course of several years as detd. by Vieille is also considered. W. A. Mosse

METALLURGICAL LITERATURE CLASSIFICATION

AUTHOR INDEX

S/806/62/000/003/008/018

AUTHORS: Bochvar, O.S., Pokhadayev, K.S.

TITLE: On the phase diagram of the Al-Cu-Cd system.

SOURCE: Akademiya nauk SSSR. Institut metallurgii. Issledovaniye splavov tsvetnykh metallov. no.3. 1962, 93-97.

TEXT: The paper reports on experimental thermal and metallographic analysis work on the ternary Al-Cu-Cd system in the Al-rich region on which no other literature is available. The binary Al-Cu and Cd-Cu systems exhibit homogeneous liquids at any component concentration, but contain several chemical compounds each in the solid phase. The Al-Cd system forms two mutually nonmiscible liquids over a broad range of concentrations. Cu and Cd enter into solid solution with Al; no information is available on the solubility of Al in Cd. The tests showed that the region of nonmiscibility of two different liquid solutions in the ternary system Al-Cu-Cd prevails with Cu concentrations up to 50%. The system admits a pseudo-binary θ-Cd section, and all alloys contained within the Al-Cd-θ triangle have 3 solid phases; an α-Al solid solution and a θ solid solution based on the compound $CuAl_2$, and one on Cd. The alloys of the pseudobinary θ-Cd section have a broad region of liquid-phase stratification, and the crystallization process is accompanied by monotectic decomposition. The existence of the pseudobinary section appears to be a consequence of

Card 1/2

POKHARITOV, I.

Shabanov, D.; Pokharitov, I. Irrigating tobacco plants. p.27.
KOOPERATIVNO ZEMEDELIE. Sofiya. Vol. 10, no. 7, July 1955.

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 4, no. 10, Oct. 1955. Uncl.

POKHBALENSKIY, Ye. D.

"A New Variant of the Method of Development of Acid Ninaqueous Sulfate of Ferric Oxide $FE_2O_3.4SO_3.9H_2O$," Zhur., Obshch. Khim., 16, No. 7, 1946. Lab. Electric & Colloidal Chemistry, Saratov State Univ., im. N.G. Chernyohevskiy, -1945-.

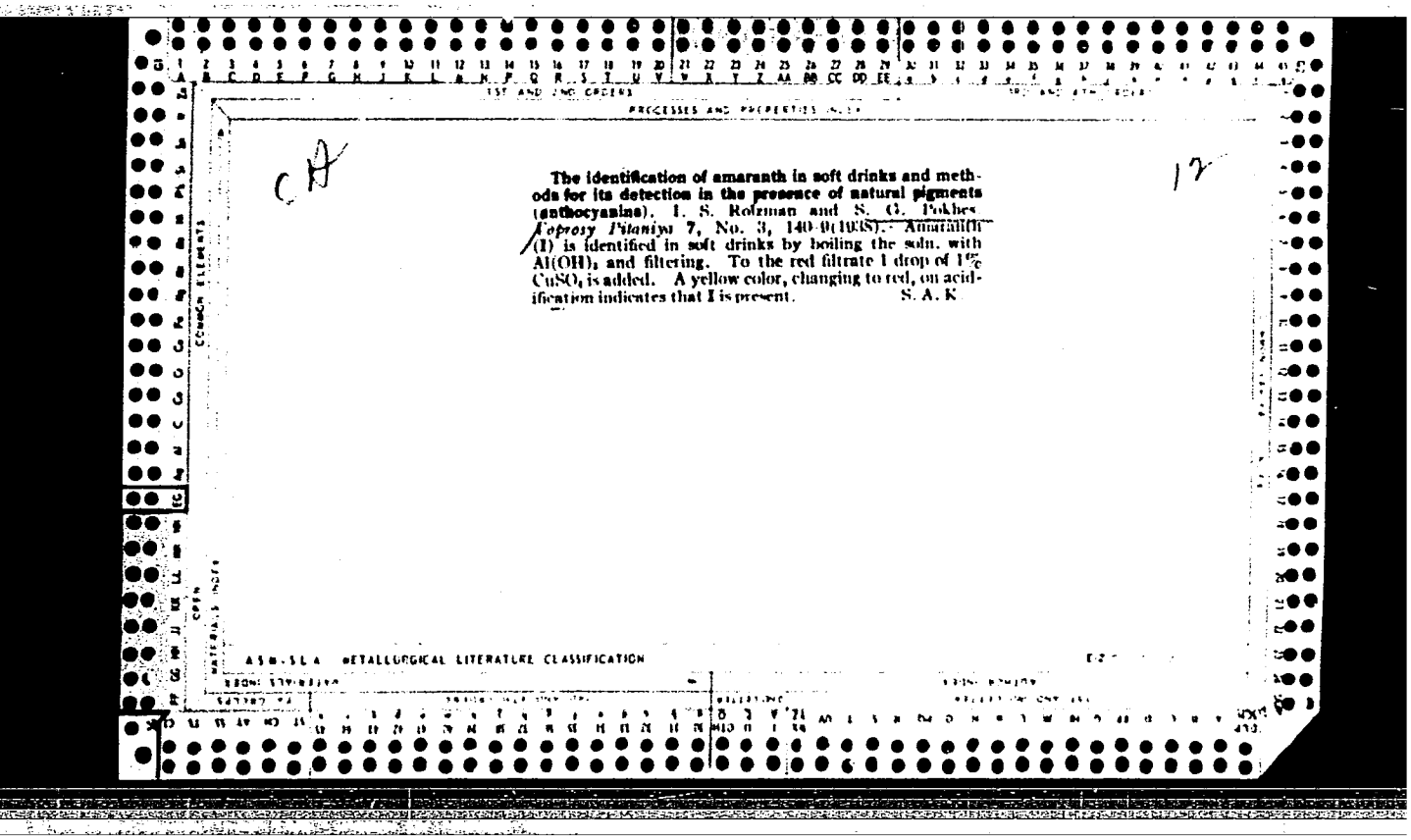
POKHELES, E. L.

TROSHICHEV, V. M. - Khudozhnik i, GROMOV, V. L. - Kand. Tekh. Nauk, POKHELES, E. L. - Arkh., PSHENICHNIKOVA, O. S. - Arkh., BUYANOV, Yu. P. - Inzh., BYKOVSKIY, O. L. - Arkh., BAYAR, O. G. (Rukovoditel'temy) - Kand. Arkhitektury, MAKOTINSKIY, N. P. - Kand. Arkhitektury, RABINOVICH, I. L. - Arkh., CHERIKOVER, L. Z. - Arkh., ANDREYEVSKIY, V. G. - Kand Tekhn. Nauk

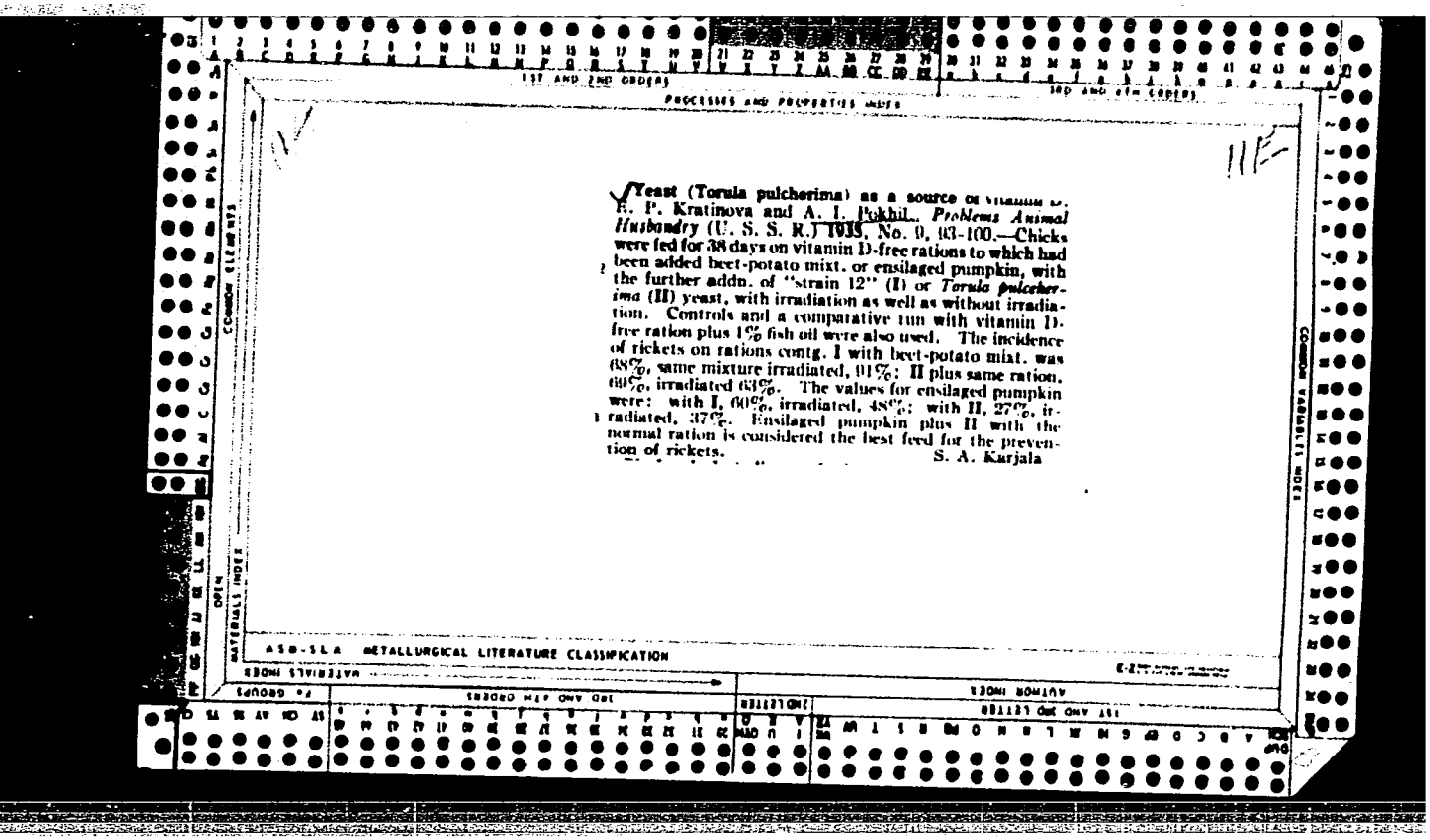
Nauchnoissledovatel'skiy institut stroitel'noy tekhniki Akademii arkhitektury SSSR

Predlozheniya po oborudovaniyu i otdelke kvartir mnogoetazhnykh zhilykh domov v moskve (Al'bom)
Page 67

SO: **Collection of Annotations of Scientific Research Work on Construction, completed in 1950. Moscow, 1951.**



The identification of amaranth in soft drinks and methods for its detection in the presence of natural pigments (anthocyanins). I. S. Rolzman and S. G. Pokhes. *Voprosy Pitaniya* 7, No. 3, 140-9(1938).—Amaranth (I) is identified in soft drinks by boiling the soln. with $Al(OH)_3$ and filtering. To the red filtrate 1 drop of 1% $CuSO_4$ is added. A yellow color, changing to red, on acidification indicates that I is present. S. A. K.



Yeast (Torula pulcherima) as a source of vitamin D. R. P. Kratinova and A. I. Pukhil. *Problems Animal Husbandry* (U. S. S. R.) 1935, No. 9, 93-100.—Chicks were fed for 38 days on vitamin D-free rations to which had been added beet-potato mixt. or ensilaged pumpkin, with the further addn. of "strain 12" (I) or *Torula pulcherima* (II) yeast, with irradiation as well as without irradiation. Controls and a comparative run with vitamin D-free ration plus 1% fish oil were also used. The incidence of rickets on rations contg. I with beet-potato mixt. was 88%, same mixture irradiated, 91%; II plus same ration, 69%, irradiated 63%. The values for ensilaged pumpkin were: with I, 60%, irradiated, 48%; with II, 27%, irradiated, 37%. Ensilaged pumpkin plus II with the normal ration is considered the best feed for the prevention of rickets.

S. A. Karjala

POKHIL, A. I.

Pokhil, A. I. "Experiment of vaccino-therapy of brucellosis," Nauch. trudy (Ukr. in-t eksperim. veterinarii), Vol. XIV, 1946, p. 66-862 - Bibliog: 17items

SO: U-2888, Letopis Zhurnal'nykh Statey, No. 1, 1949

POKHIL, A. I.

Pokhil, A. I. and Dvornikova, Ye. I. "Furhter investigation of the biological causal agent of rye bacillosis of swine," Nauch. trudy (Ukr. in-t eksperim. veterinarii), Vol. XIV, 1946, p. 143-52 - Bibliog: 8 items

SO: U-2888, Letopis Zhurnal'nykh Statey, No. 1, 1949

POKHIL, A. I.

A.I. Pokhil, Candidate of Veterinary Sciences, Ukrainian Institute of Experimental Veterinary Medicine, author of an article "Study of Virus-discharge in Natural and Experimental Fowl Plague", reviewed by F. K. Borisovich. (Lists the author's conclusions).
SO: Veterinariya; Vol. 23; 8-9; 16-18; August/September 1946 unclass
Trans. # 312 by L. Lulich -- also Trans 102 by L. Lulich

POKHIL, A. I.

Pokhil, A. I. and Kazarova, Ye. I. - "The ring precipitation reaction as a means of diagnosing bacteriosis in silkworms", Sbornik Trudov (Khar'k. zootekhn. in-t), Vol. V, Issue 1, 1948, p. 161-69.

SO: U-3042, 11 March 53, (Letopis 'Zhurnal 'nykh Statey, No. 8, 1949).

POKHIL, A. I.

KRICHEVSKIY, A. M.; MIKHAYLOVA, P. V.; MURZINA, V. I.; RATINA, S. M.; POKHIL, A. I.; NALBAT, A. S.

Certain data on viral etiology of psoriasis. Vest. vener., Moskva no.4:11-15 July-Aug 1951. (CIML 21:1)

1. Of the Ukrainian Scientific-Research Skin-Venereological Institute (Director -- Prof. A. M. Krichevskiy).

POKHIL, A. I.

USSR/Medicine - Psoriasis

July/Aug 52

"Review of the Article Data on the Virus Etiology of Psoriasis, by A. M. Krichevskiy, P. V. Mikhailova, V. I. Myrzina, S. M. Patina, A. I. Pokhil, A. S. Nalbat," (Prof E. S. Yablenik, Frunze, reviewer)

Vest Vener i Derm, No 4, pp 30, 31

Describes an exptl infection of animals with psoriasis serum. Lab findings confirmed the author's assumption that a disorder in the lipide metabolism is a diathesis factor leading to the appearance of a complex of symptoms in a rabbit closely resembling psoriasis of man. On the basis of exptl work and clinical observations, the author assumes that a filterable virus is the causal agent of psoriasis.

MERKULOV, I.I.; POKHIL, A.I.

Hyperergic reaction of the oculomotor nerve to repeated administrations of allergens. Vop. neirooft. 5:133-138 '60. (MIRA 14:3)
(OCULOMOTOR NERVE) (ALLERGY)

POKHIL, F.P.; MAL'TSEV, V.M.; LUKASHENYA, G.V.

Device for measuring the temperature profile of gunpowder flames. Zhur. fiz. khim. 35 no.5:1142-1143 My '61.
(MIRA 16:7)

1. Institut khimicheskoy fiziki AN SSSR.
(Gunpowder) (Flame)

ACCESSION NR: AP4011720 S/0055/64/000/001/0021/0028

AUTHORS: Berezin, F. A.; Pokhil, G. P.; Finkel'berg, V. M.

TITLE: Schrödinger equation for system of one-dimensional particles with point interaction

SOURCE: Moscow. Universitet. Vestnik. Seriya 1. Matematika, mekhanika, no. 1, 1964, 21-28

TOPIC TAGS: Schrödinger equation, point interaction, delta function, wave function, scattering theory, elastic theory

ABSTRACT: The Schrödinger equation for n one-dimensional particles of equal mass and point interaction field is given

$$\left[-\sum_{\mu=1}^{n}\frac{\partial^2}{\partial x_\mu^2}-2\lambda\sum_{\mu<\nu}\delta(x_\mu-x_\nu)\right]\psi(x_1\ldots x_n)=E\psi(x_1\ldots x_n),$$

where $x_1,\ldots,x_n$ -particle coordinate, 2λ -interaction constant, and $\delta(x)$ - Dirac delta function. An explicit solution is obtained for the wave function ψ in the form

$$\psi=\exp(ik_1x_{a_1}+\ldots+ik_nx_{a_n}),$$

Card 1/2

ACCESSION NR: AP4011720

where $k_1 \ldots\ldots k_n$ - arbitrary complex numbers. A detailed solution is given for $n = 3$ both in a repulsing and an attracting field. The ψ-functions of the scattering theory are found, satisfying the Lippmann-Schwinger equations, and their completeness (both in coordinate and momentum space) is proved. The scattering operator is constructed in terms of the ψ-functions

$$S(b|a) = \int d^3x\, \overline{\psi_{out}(x|b)}\, \psi_{in}(x|a).$$

and its eigenfunctions and eigenvalues, in particular for symmetric function subspace with elastic scattering, are found. "The authors express their gratitude to the members of the I. Ye. Tamm seminar in FIAN in October 1962." Orig. art. has: 29 equations.

ASSOCIATION: Moskovskiy universitet, Kafedra teorii funktsiy i funktsional'nogo analiza (Moscow University, Department of Theory of Functions and Functional Analysis)

SUBMITTED: 07Feb63 DATE ACQ: 14Feb64 ENCL: 00

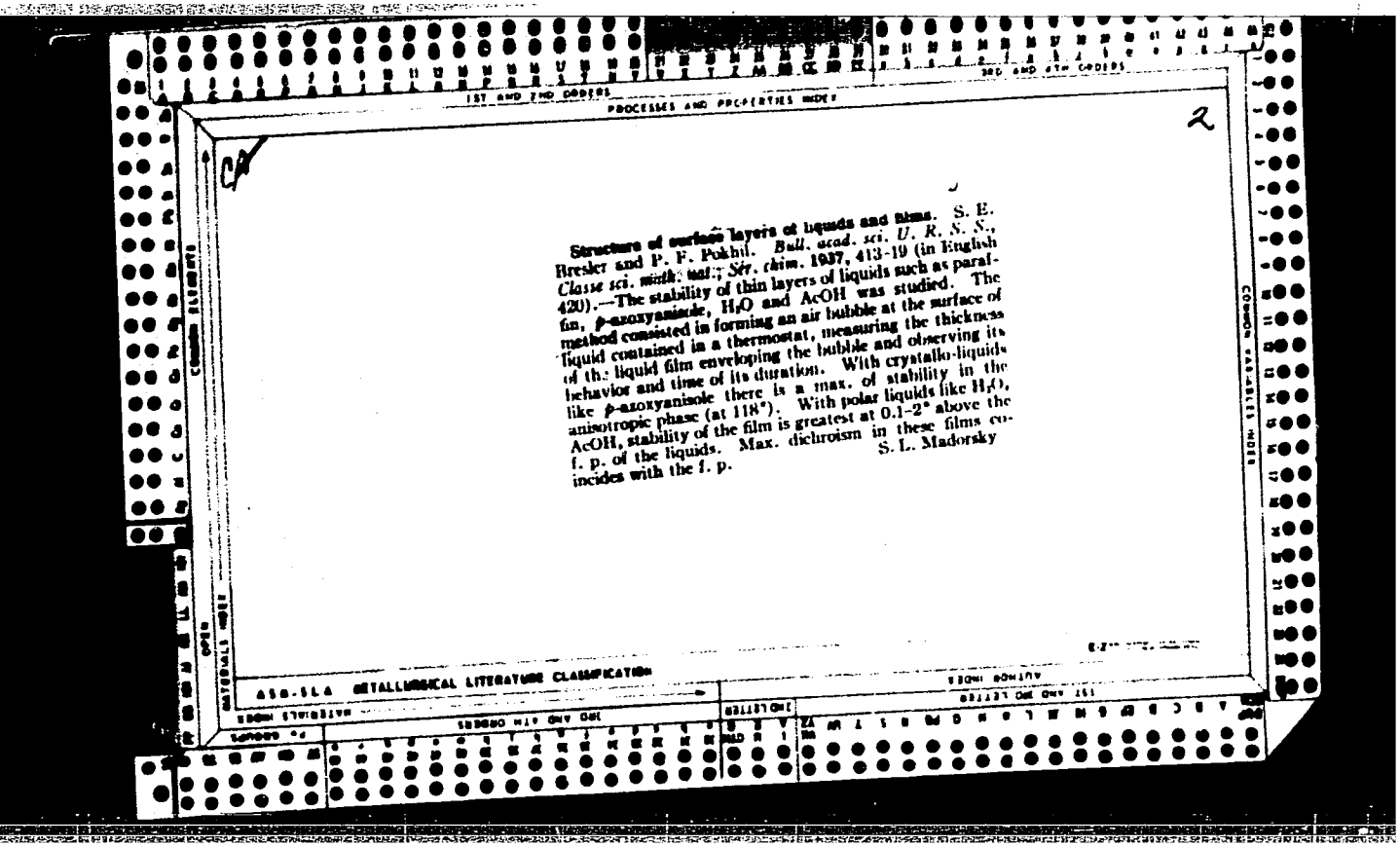
SUB CODE: PH NO REF SOV: 003 OTHER: 003

Card 2/2

POKHIL', I.F.

Out method of storing mother beets. Sakh. prom. 32 no.11:41-42 N '58. (MIRA 11:12)

1.Skidel'skiy sakhkombinat, BSSR.
(Skidel'--Sugar beets--Storage)



Structure of surface layers of liquids and films. S. E. Bresler and P. F. Pokhil. *Bull. acad. sci. U. R. S. S., Classe sci. math. nat.; Sér. chim.* 1937, 413-19 (in English 420).—The stability of thin layers of liquids such as paraffin, *p*-azoxyanisole, H_2O and AcOH was studied. The method consisted in forming an air bubble at the surface of liquid contained in a thermostat, measuring the thickness of the liquid film enveloping the bubble and observing its behavior and time of its duration. With crystallo-liquids like *p*-azoxyanisole there is a max. of stability in the anisotropic phase (at 118°). With polar liquids like H_2O, AcOH, stability of the film is greatest at 0.1–2° above the f. p. of the liquids. Max. dichroism in these films coincides with the f. p.

S. L. Madorsky

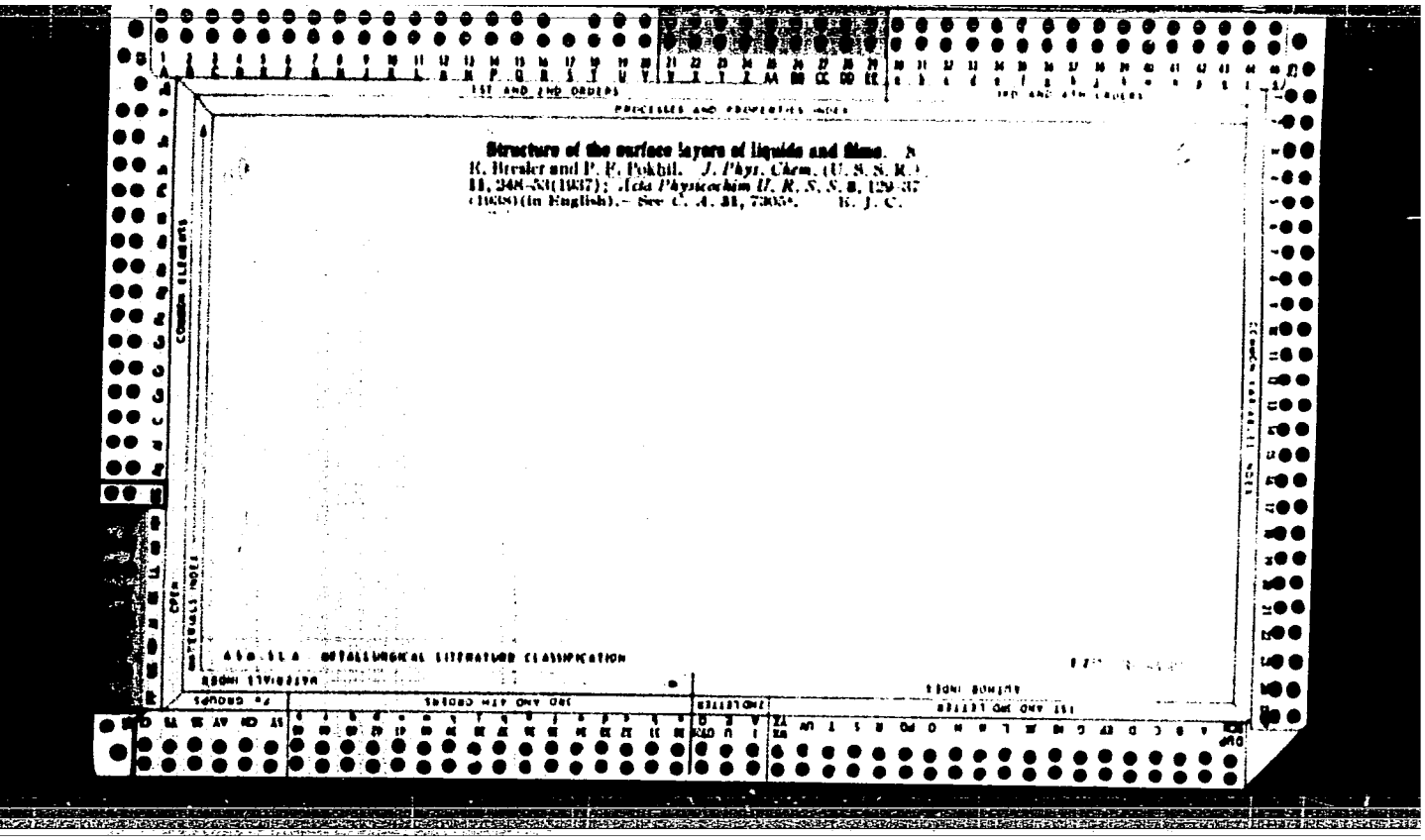
A 1

BC

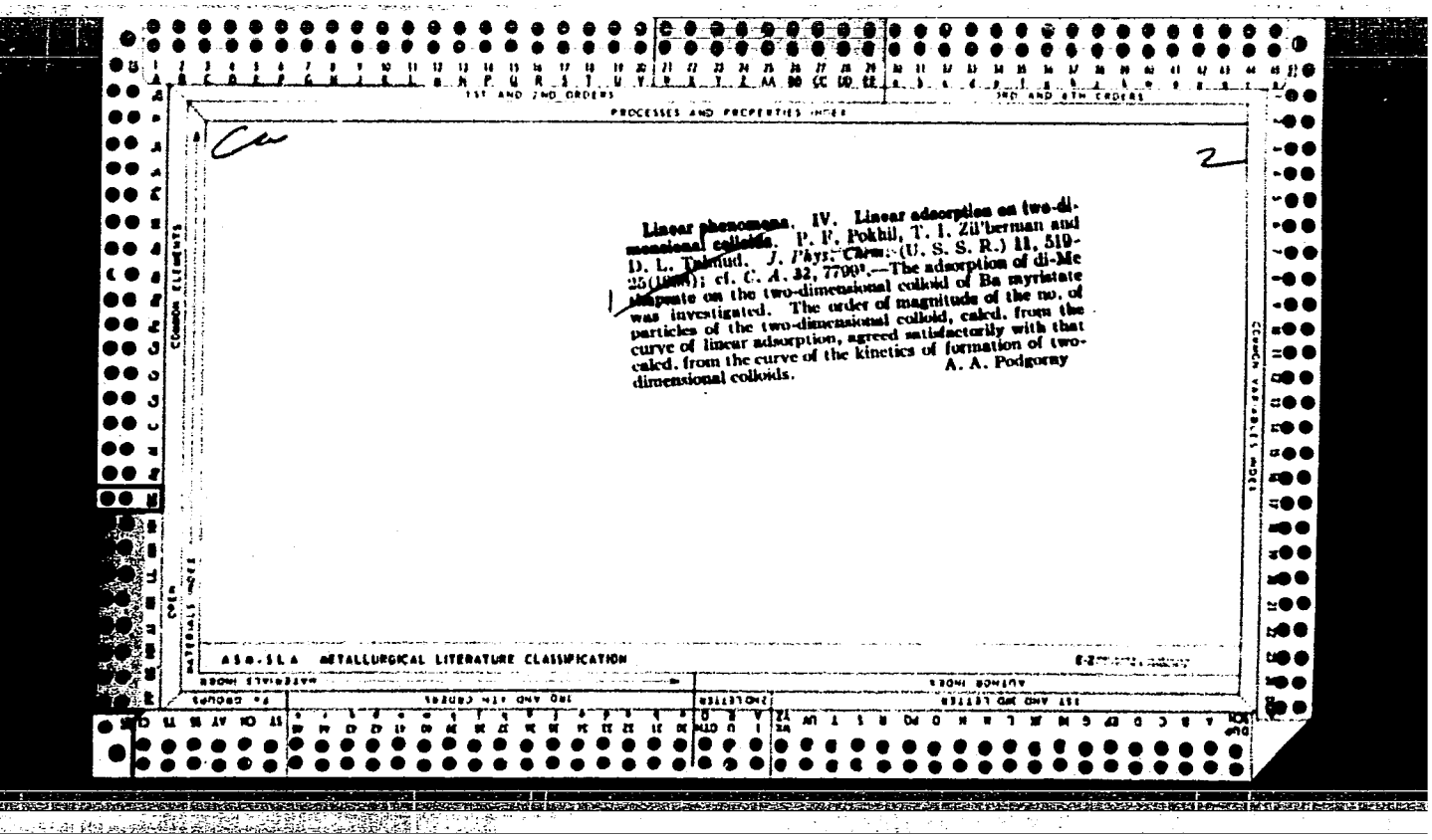
Kinetics of the formation and solvation of two-dimensional colloids. [illegible], T. J. [illegible], and D. L. Talmud (Acta Physicochim. U.R.S.S., 1937, 7, [illegible]).—Methods by which two-dimensional colloids can be obtained by condensation in the process of double decomp. are described. These have been employed in the formation of colloids of silicic acid, $Fe(OH)_3$, $Al(OH)_3$, Ba and Ag myristate, and combinations of cetyl alcohol with Ag and Ba. The kinetics of formation of these colloids, measured by static and dynamic methods involving the decrease in the surface pressure of monolayers due to aggregation of mols. in the latter, indicate (a) the total no. of aggregating mols. in the monolayer, (b) the order of magnitude of the particles of the colloid. Individual aggregates consist of ~1000 mols. The connexion is discussed between the formation and properties of a two-dimensional colloid with the solvation of the polar groups in the monolayer, and with the adsorption of the excess ions of a given charge. W. R. A.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341620005-9"



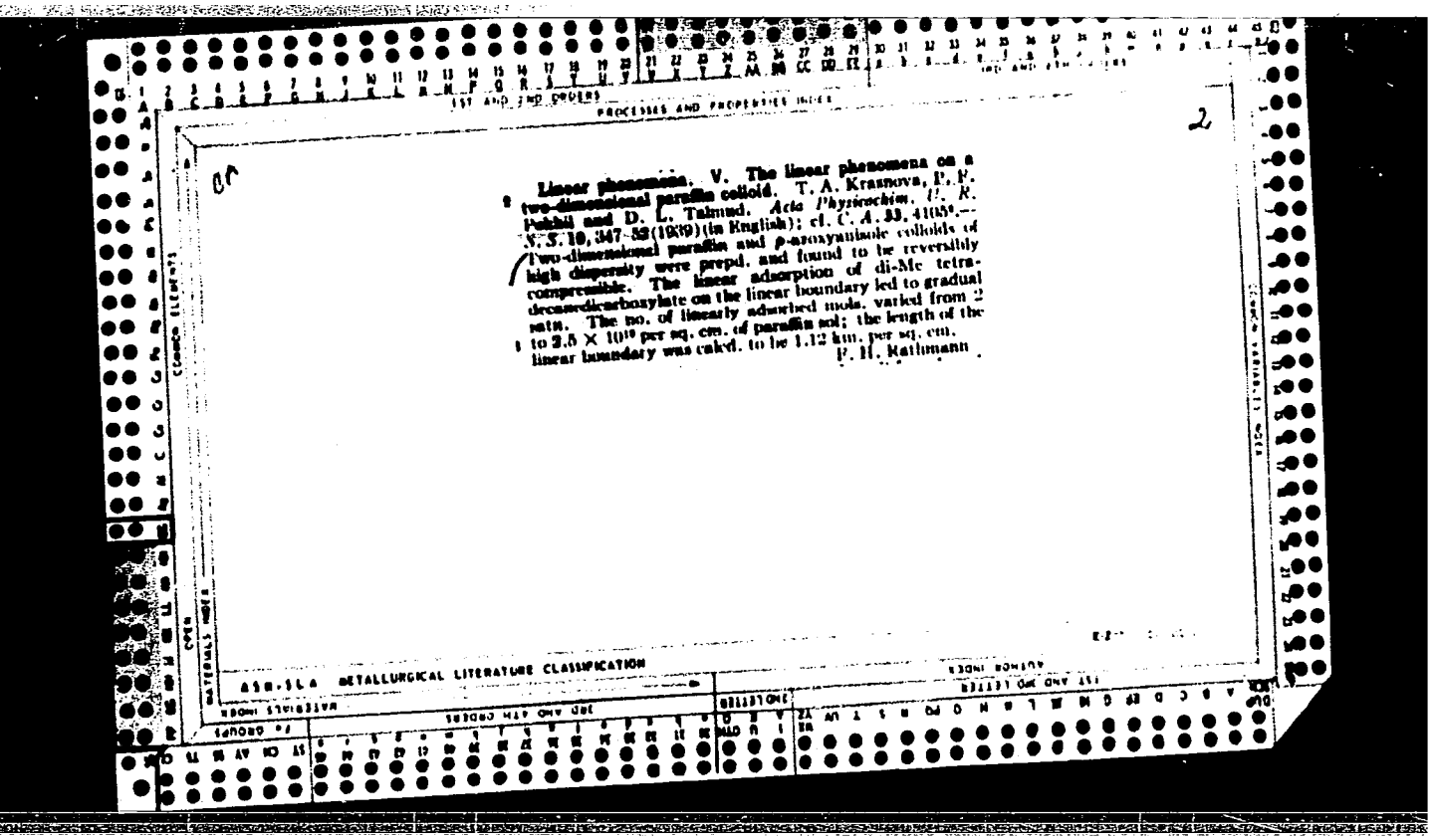
Structure of the surface layers of liquids and films. A
K. Bresler and P. P. Pokhil. *J. Phys. Chem.* (U. S. S. R.)
11, 348–53(1937); *Acta Physicochim U. R. S. S.* 8, 129–37
(1938)(in English).– See C. A. 31, 7305⁸. K. J. C.



PROCESSES AND PROPERTIES INDEX

Linear phenomena. IV. Linear adsorption on two-dimensional colloids. P. F. Pokhil, T. I. Zil'berman and D. L. Talmud. *J. Phys. Chem.* (U. S. S. R.) **11**, 519-25(1938); cf. C. *A.* **32**, 7790⁸.—The adsorption of di-Me stearate on the two-dimensional colloid of Ba myristate was investigated. The order of magnitude of the no. of particles of the two-dimensional colloid, calcd. from the curve of linear adsorption, agreed satisfactorily with that calcd. from the curve of the kinetics of formation of two-dimensional colloids. A. A. Podgorny

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

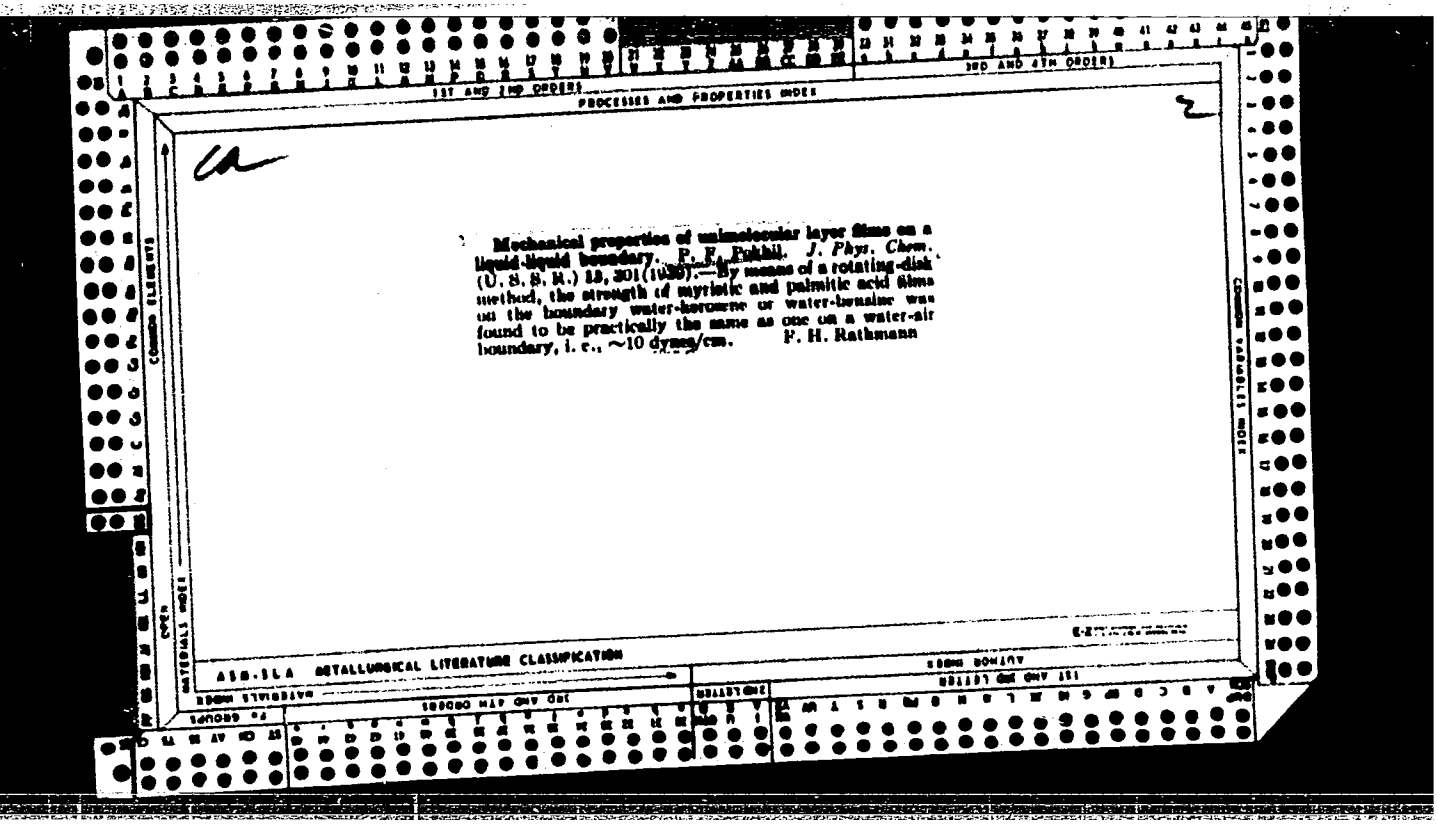


Linear phenomena. V. The linear phenomena on a two-dimensional paraffin colloid. T. A. Krasnova, P. P. Pakhil and D. L. Talmud. *Acta Physicochim. U. R. S. S.* 10, 347-58 (1939) (in English); cf. *C. A.* 33, 4105⁹.—Two-dimensional paraffin and *p*-azoxyanisole colloids of high dispersity were prepd. and found to be reversibly compressible. The linear adsorption of di-Me tetradecanedicarboxylate on the linear boundary led to gradual saturation. The no. of linearly adsorbed mols. varied from 2 to 2.5 × 10¹⁰ per sq. cm. of paraffin sol; the length of the linear boundary was calcd. to be 1.12 km. per sq. cm.
P. H. Ratlimann

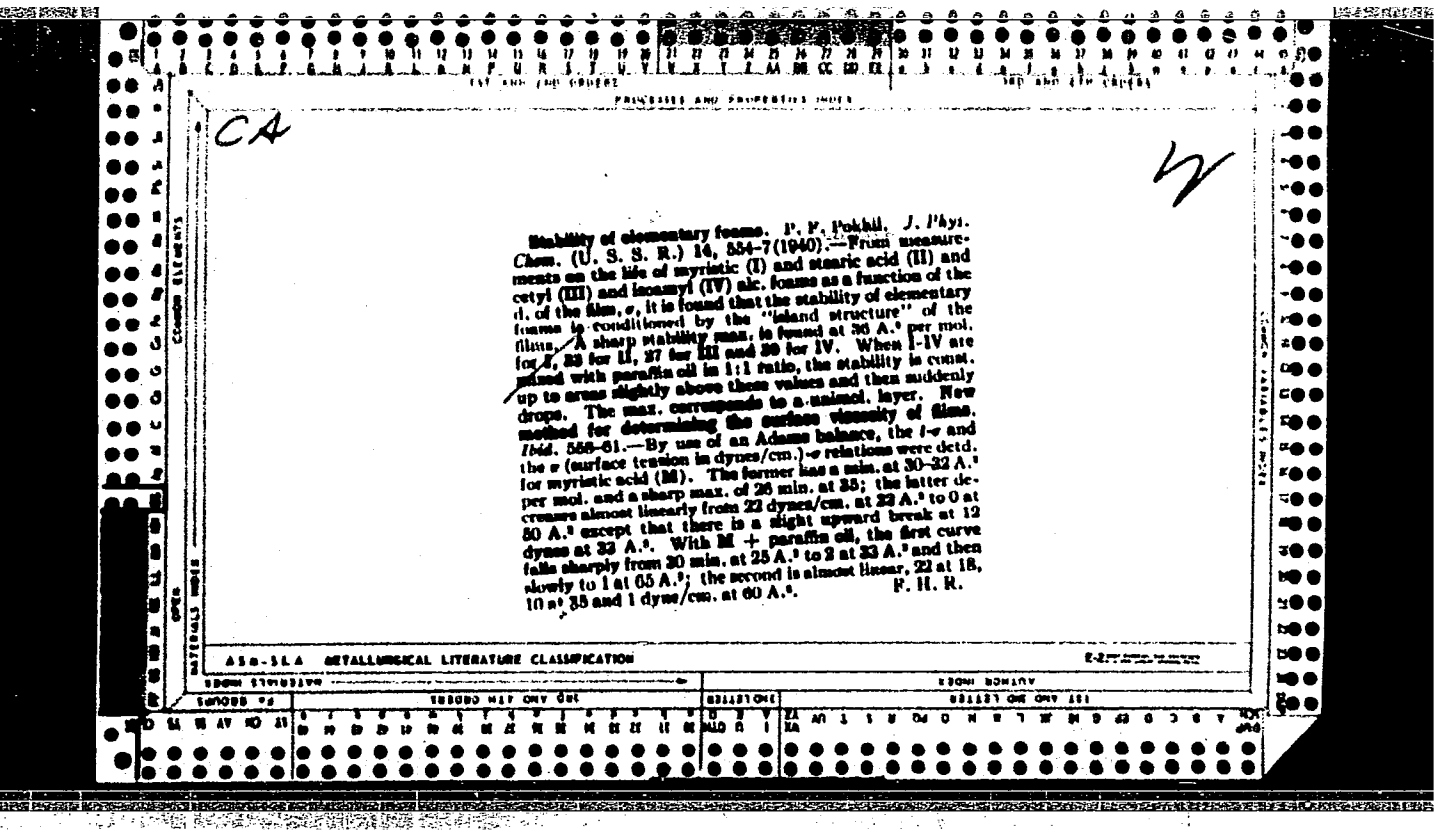
POHIL, P. F.

"Preliminary Reports and Discussion — A New Method of Determining the Rate of Diffusion (the Mobility) of Molecules of Surface-Active Substances at the separation Surface Solid/Gas"; Zhur. Fiz. Khim., 12, No. L, 1939. Laboratory of Surface Phenomena, Insti. of Physician & Chem. Research, Leningrad. Rcd 26 Oct. 1938.

[redacted] Report U-1613, 3 Jan. 1952.



Mechanical properties of unimolecular layer films on a liquid-liquid boundary. P. F. Pukhil. *J. Phys. Chem.* (U. S. S. R.) 13, 301 (1939).—By means of a rotating-disk method, the strength of myristic and palmitic acid films on the boundary water-benzene or water-toluene was found to be practically the same as one on a water-air boundary, i. e., ~10 dynes/cm. F. H. Rathmann



CA

W

Stability of elementary foams. P. F. Pokhil. *J. Phys. Chem.* (U. S. S. R.) 14, 554–7(1940).—From measurements on the life of myristic (I) and stearic acid (II) and cetyl (III) and lignoceryl (IV) alc. foams as a function of the d. of the film, σ, it is found that the stability of elementary foams is conditioned by the "island structure" of the films. A sharp stability max. is found at 36 A.^{2} per mol. for I, 33 for II, 27 for III and 30 for IV. When I–IV are mixed with paraffin oil in 1:1 ratio, the stability is const. up to areas slightly above these values and then suddenly drops. The max. corresponds to a unimol. layer. New method for determining the surface viscosity of films. *Ibid.* 558–61.—By use of an Adams balance, the l–σ and the π (surface tension in dynes/cm.)–σ relations were detd. for myristic acid (M). The former has a min. at 30–32 A.^{2} per mol. and a sharp max. of 26 min. at 35; the latter decreases almost linearly from 22 dynes/cm. at 32 A.^{2} to 0 at 50 A.^{2} except that there is a slight upward break at 12 dynes at 32 A.^{2}. With M + paraffin oil, the first curve falls sharply from 30 min. at 25 A.^{2} to 2 at 33 A.^{2} and then slowly to 1 at 65 A.^{2}; the second is almost linear, 22 at 18, 10 at 35 and 1 dyne/cm. at 60 A.^{2}. F. H. R.

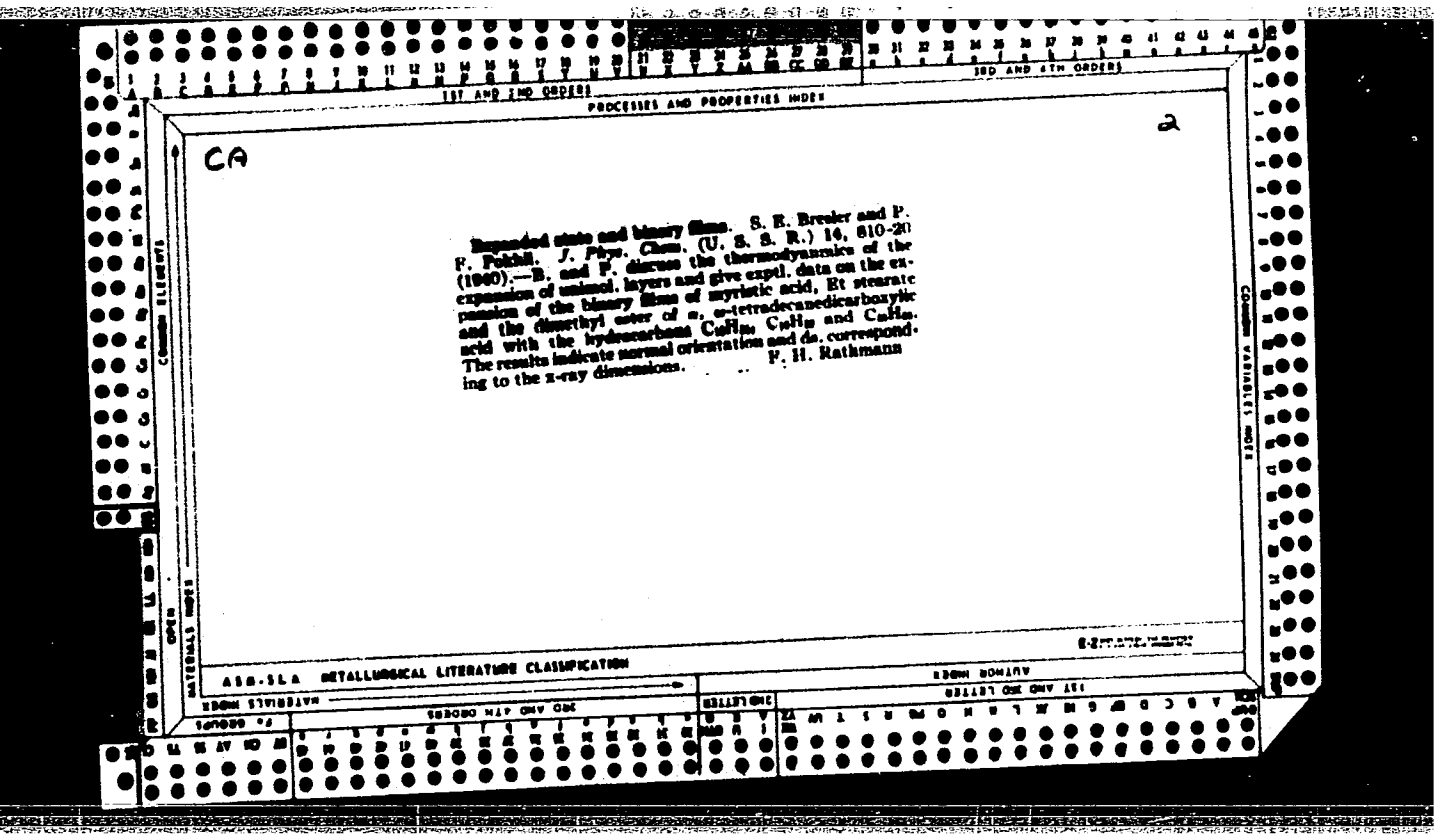
FOMIN, P. F.

Leningrad

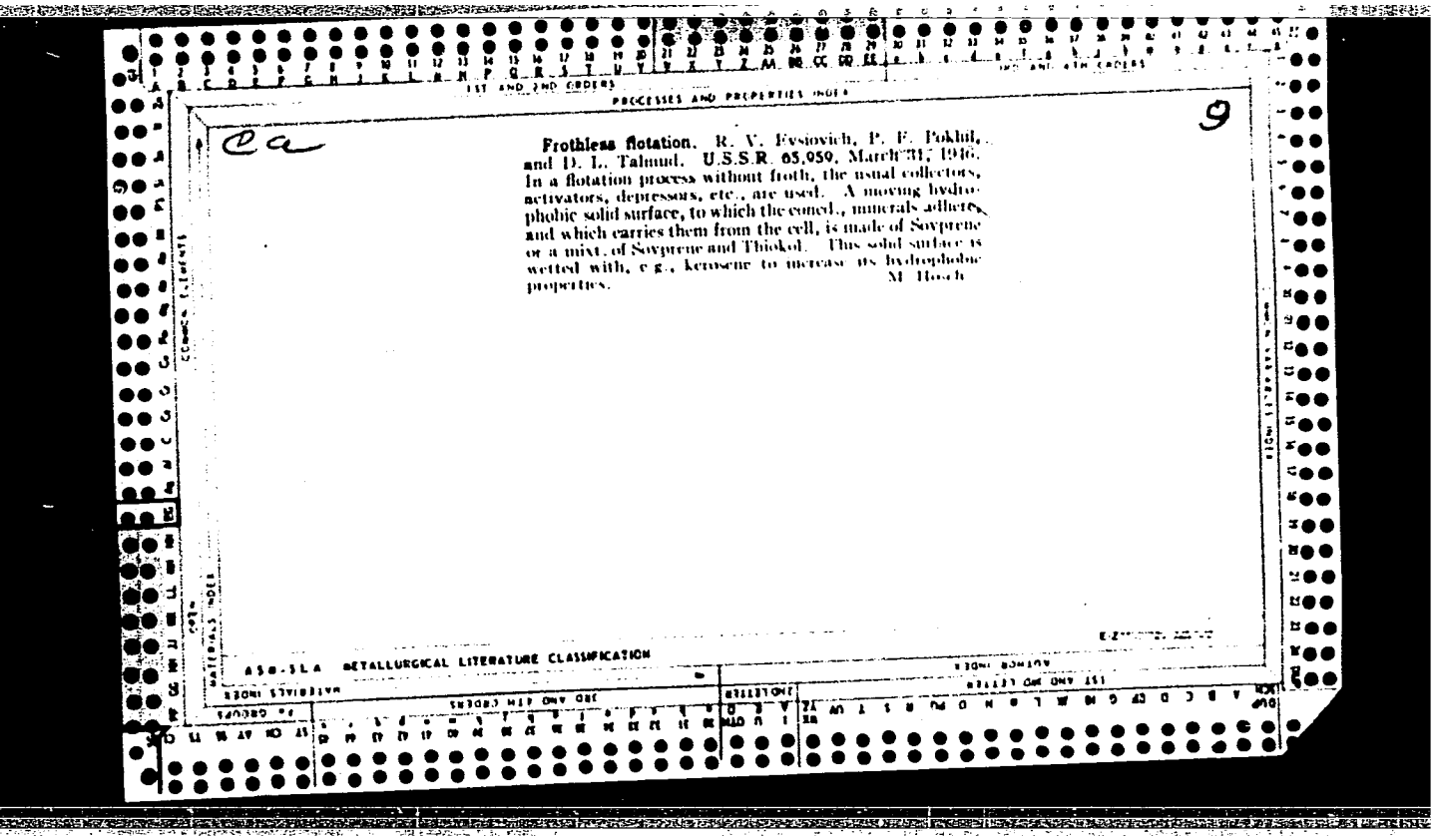
Laboratory of Surface Phenomena, Institute of Physical and Chemical Research, (-1940-).

"A New Method of Determining the Surface Viscosity of a Film."

Zhur. Fiz. Khim., Vol. 14, No. 4, 1940



Expanded films and binary films. S. R. Breuer and P. F. Pokhil. *J. Phys. Chem.* (U. S. S. R.) 14, 810-20 (1940).—B. and P. discuss the thermodynamics of the expansion of unimol. layers and give expt'l. data on the expansion of the binary films of myristic acid, Et stearate and the dimethyl ester of *n*, *n*-tetradecanedicarboxylic acid with the hydrocarbons $C_{16}H_{34}$, $C_{18}H_{38}$ and $C_{20}H_{42}$. The results indicate normal orientation and do correspond to the x-ray dimensions. P. H. Rathmann



PROCESSES AND PROPERTIES INDEX

Ca

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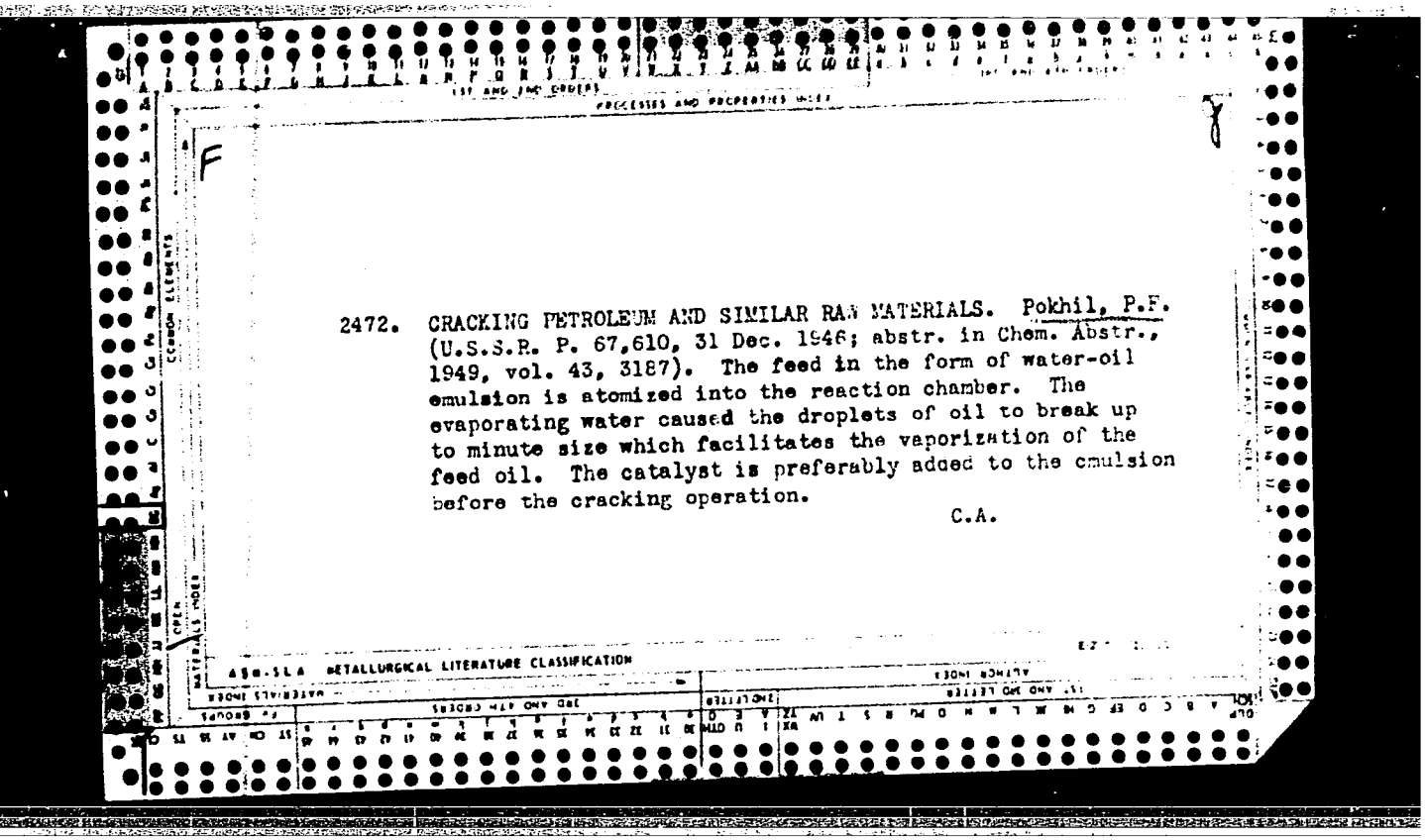
Frothless flotation. R. V. Evsiovich, P. F. Pokhil, and D. L. Talmud. U.S.S.R. 65,059, March 31, 1946. In a flotation process without froth, the usual collectors, activators, depressors, etc., are used. A moving hydrophobic solid surface, to which the concd., minerals adheres, and which carries them from the cell, is made of Sovprene or a mixt. of Sovprene and Thiokol. This solid surface is wetted with, e.g., kerosene to increase its hydrophobic properties. M. Hoch

A58-3LA METALLURGICAL LITERATURE CLASSIFICATION



F

2472. CRACKING PETROLEUM AND SIMILAR RAW MATERIALS. Pokhil, P.F. (U.S.S.R. P. 67,610, 31 Dec. 1946; abstr. in Chem. Abstr., 1949, vol. 43, 3187). The feed in the form of water-oil emulsion is atomized into the reaction chamber. The evaporating water caused the droplets of oil to break up to minute size which facilitates the vaporization of the feed oil. The catalyst is preferably added to the emulsion before the cracking operation.

C.A.

SOV/20-123-4-16/53

10(2)

AUTHORS: Bolkhovitinov, L. G., Pokhil, P. F.

TITLE: The Calculation of the Lower Limit of the Curve of the Frequency of an Explosion (Vychisleniye nizhnego predela krivoy chastoty vzryva)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 4, pp 637-638 (USSR)

ABSTRACT: The characteristic feature of every percussion test carried out for the purpose of investigating the shock susceptibility of explosives is the fact that in these tests a so-called curve of explosion frequency is obtained. The critical temperature for an explosion center measuring 10^{-5} cm has been calculated for several explosions. Like N. A. Kholevo, the authors in this case assume that the explosive is heated by plastic deformation. They calculate the lower limit for the curves of explosion frequency for a concrete case, viz. for tests carried out by means of a device provided with a firing pin. In this device, which was suggested by N. A. Kholevo, the substance is able to flow freely. The explosion is assumed to occur at the beginning of the collision when the deformation of the suspending device is still

Card 1/4

The Calculation of the Lower Limit of the Curve of the Frequency of an Explosion

small. If the mass of the charge is sufficiently large, the variation of its energy during deformation of the substance in the initial stage of the collision can be neglected, and the velocity of the charge may be considered to be constant. The author calculates heating of a substance with the volume l^3 by deformation, in which connection the equation $l^3 c\varrho \, dT/dt = -kl^2(T - T_o) + Q$ is solved. Here k denotes the heat transfer coefficient, c - the specific heat of the substance, ϱ - its density, Q - the heat separated by external working stress. The initial condition is that at $t = 0$ it holds that $T = T_o$. An expression for the radial velocity v_r is written down. For the approximated calculation of heat transfer per unit of time and volume it is possible to confine oneself to the component $\partial v_r/\partial z$. The expression resulting herefrom for Q is explicitly written down. As the velocity of the charge and the thickness of the layer are assumed to be constant, also transfer of heat remains constant. An explicit expression for T is written down. The most intensive heat transfer is that on the periphery of the de-

Card 2/4

The Calculation of the Lower Limit of the Curve of the Frequency of an Explosion

formed suspension device. In this connection an expression is obtained for the minimum velocity of the charge at which the probability of the explosion becomes different from zero. For a certain hypothetical explosive (with properties similar to those of tetryl) the value of 10 cm/sec is obtained for the aforementioned minimum velocity. This value agrees well with numerous experimental data obtained for explosives such as "ten", hexogen, and tetryl. There is 1 Soviet reference.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences, USSR)

PRESENTED: July 7, 1958, by V. N. Kondrat'yev, Academician

SOV/20-127-1-35/65

5(4)

AUTHORS: Gal'perin, L. N., Mal'tsev, V. M., Pokhil, P. F.

TITLE: Measurement of the Flame Temperature of Condensed Systems (Izmereniye temperatury plamen kondensirovannykh sistem)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 127, Nr 1, pp 131-134 (USSR)

ABSTRACT: A method of measuring the temperature is suggested here, which is based on the blue-red ratio (Refs 1-3). The system is depicted in figure 1. The constant light source is given by a xenon lamp SVDSh-1000. The powder sample is ignited electrically in a cylinder under pressure. The light emitted by the xenon lamp is directed through the powder flame and a collimator by means of an optical arrangement; it is then split into two beams in a double prism, the two beams are directed through a red and a blue filter respectively, and the light pulses are intensified by means of a photomultiplier. Experiments were made with nitro glycerin powder under pressures of from 20 to 150 at. Figure 2 shows that in the case of 50 at the flame temperature attains the maximum of 2,200°K, which remains constant with further rising pressure. With rising pressure, however, the

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distance between the hottest flame zone and the powder surface narrows (Fig 3): 6.2 mm at 20 at, 2.7 mm at 50 at . The dependence of the light absorption capacity of the flame on pressure is shown in figure 4. The situation of the pressure-dependant maximum of light permeability over the powder surface is explained by the burning process: (1) formation of a strongly light-absorbing flue gas mixture, (2) decrease in the weight- and particle concentration of the smoke owing to combustion, (3) increase in the concentration of aerosol particles (soot) with rising temperature. There are 4 figures and 6 Soviet references.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR
(Institute of Chemical Physics of the Academy of Sciences, USSR)

PRESENTED: March 10, 1959, by V. N. Kondrat'yev, Academician

SUBMITTED: March 10, 1959

5(4),2(5) SOV/20-127-6-28/51

AUTHORS: Dremin, A. N., Pokhil, P. F.

TITLE: The Width of the Chemical Reaction Zone in a Trotyl Detonation Wave

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 127, Nr 6, pp 1245-1248 (USSR)

ABSTRACT: The structure of the plane detonation wave as proposed by Ya. B. Zel'dovich is the issue for the following study. The detonation wave consists of a shock front and is followed by the chemical reaction zone with the width a, that is limited by the Chapman-Zhuge-plane (Fig 1). The experimental measurement of a was described in reference 2. The profile of the shock wave in metals is determined by measurement of the initial velocity W of the free surface of variously thick metal lamellas. The measurement was performed by means of electroconductors whose signals were recorded by an oscillograph. A formula for a is deduced and a total error of about 20-30% computed. Further formulas for the pressure P, mass velocity U and the adiabatic shock line D are described for magnesium, copper, and aluminium. Measuring results are put down in table 1 and figure 2, the calculated amounts of P and U in table 2. In regard of the reflected wave, the amount

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0.22 mm is found for a (Fig 3). Furthermore, a formula for the reaction degree τ is given and the dependence of a on the density of the trotyl graphically described (Fig 4). There are 4 figures, 4 tables, and 5 references, 2 of which are Soviet.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences, USSR)

PRESENTED: April 7, 1959, by V. N. Kondrat'yev, Academician

SUBMITTED: March 31, 1959

SOV/20-128-1-36/58

5(1)

AUTHORS: Pokhil, P. F., Romodanova, L. D.

TITLE: The Behavior of Dinitrotoluene During the Combustion Process of Powder

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 128, Nr 1, pp 133-135 (USSR)

ABSTRACT: The method of tagged atoms was used in the present paper for the investigation of the behavior of dinitrotoluene during the combustion process of nitroglycerin powder N. The vacuum device schematically given in figure 1 was used in order to determine in which combustion stage the chemical decomposition of dinitrotoluene takes place. The activity of gaseous products of combustion which are produced during the combustion of powder within the range of pressure of 8 - 600 mm was examined by the electrometer SG-2M. The activity of the smoke was determined by means of an end-window counter. The combustion of the radioactive powder within the range of increased pressures of 5-120 atmospheres proceeded in a bomb schematically given in figure 2. The activity of gaseous products of combustion was determined here. The bomb was blown through with nitrogen before the experiment in order to eliminate the influence of atmospheric oxygen on the combustion process. The necessary pressure was produced as well with nitrogen. The

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SOV/20-128-1-36/58

The Behavior of Dinitrotoluene During the Combustion Process of Powder

experiments were carried out at a room temperature of approximately 20°. From the experimental results it is concluded that radioactive products of combustion are not produced during a flameless combustion. Dinitrotoluene is obviously not decomposed in the initial stage of the combustion process which proceeds in the reaction layer of the condensed powder phase but dispersed by gaseous decomposition products of the nitrocellulose. It is possible that also a partial evaporation with subsequent condensation takes place at the walls of the container. The smoke collected from the walls of the container which was produced during the flameless combustion had the same activity as the powder. The percentage of the decomposed dinitrotoluene increases at pressure increase and progressive development of the heterogeneous-homogeneous reaction proceeding in the zone of the smoke-gas mixture. A perfect decomposition of dinitrotoluene in the combustion of the nitroglycerin powder N is attained at a pressure of approximately 80 kg/cm^2. There are 2 figures and 5 references, 3 of which are Soviet.

PRESENTED: April 27, 1959, by V. N. Kondrat'yev, Academician

SUBMITTED: April 16, 1959

Card 2/2

66182

SOV/20-128-5-36/67

2.5000
5.1300(A)

~~3(4), 3(5)~~

AUTHORS: Dremin, A. N., Pokhil, P. F.

TITLE: The Constants of the Detonation Wave of Trotyl, Hexogen, Nitrogylcerin, and Nitromethane

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 128, Nr 5, pp 989-991 (USSR)

ABSTRACT: The authors report on the results of an experimental determination of the mechanical constants of detonation waves in the Chapman - Zhuge plane. The three-equation system: (1) $\rho_o D = \rho(D - U)$ (conservation of mass); (2) $P = \rho_o DU$ (conservation of momentum); (3) $D = U + C$ (Chapman - Zhuge condition) contains five unknown constants: D = velocity of detonation, ρ = density of the explosion products, U = velocity of the explosion products, C = sonic velocity in the explosion products, and P = pressure of the explosion products in the Chapman - Zhuge plane. D and P were determined. D was measured by means of ionization pickups. P was indirectly measured. The authors measured the initial velocity W of a metal platelet fastened to the explosive.

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The Constants of the Detonation Wave of Trotyl, Hexogen, Nitroglycerin, and Nitromethane

$W = 2U_M$ (U_M = velocity of mass in the metal behind the shock-wave front). Since the adiabatic curve of the shock of the metal is known, the formula for P was derived from $P_M = \rho_{oM} D_M U_M$. The formula defines the relationship between the pressure in the detonation wave and the pressure of the shock wave propagating within the metal at velocity D_M and with initial density ρ_{om}:

$P = \frac{P_M}{2}\left(1 + \frac{\rho_o D}{\rho_{oM} D_M}\right)$. Magnesium platelets ($\rho_{oMg} = 1.72$ g/cm^2) were used for experiments on trotyl and Hexogen, and aluminum platelets ($\rho_{oAl} = 2.70$ g/cm^2) for nitroglycerin and nitromethane.

Figure 2 shows the experimental data for W. Table 1 contains the resultant values of ρ_o, D, U, P, C, and ρ. Figure 3 indicates the linear dependence of the mass velocity of trotyl and Hexogen

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The Constants of the Detonation Wave of Trotyl, Hexogen, Nitroglycerin, and Nitromethane SOV/20-128-5-36/67

on their initial density. Herefrom it follows that $\frac{D}{U} - 1$ remains constant within a wide range for explosives of great initial density. There are 3 figures, 1 table, and 6 references, 3 of which are Soviet.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences, USSR)

PRESENTED: April 27, 1959 by V. N. Kondrat'yev, Academician

SUBMITTED: April 24, 1959

Card 3/3

Pokhil, P.F.

Paper submitted for the 8th Intl Symposium on Combustion, Pasadena, California, 29 August - 2 September, 1960.

A N. Dremin — — — Detonation Parameters

P F Pokhil — — — The Mechanism of Combustion of Colloidal Powders

L S Kozachenko — — The Combustion Mechanism and Burning Velocity in a Turbulent Flow

S M Kogarko — — — On the Burning Probability for Droplets of Liquid Atomized Fuel in a Turbulent Flow

S M Kogarko — — — — Amplification of Compression Waves in the Combustion Zone

PLYUKHIN, B.I. — — —On the Stationary Theory for Heat Balance of Powder and Explosive Condensed Phases

Ya K Denisov — — — On the Mechanism of Detonative Combustion
Ya K Troshin

E S Golovina — — —The Interaction of Carbon with Carbon Dioxide and Oxygen at Temperatures up to 3000°K
G P Khaustovich

KHITRIN, L.N. — — — The Carbon Residue Burning Characteristics of Solid Fuel
RAVICH, M.B.
KOTOVA, L.L.

O A Tsukhanova — — — The Investigation of the State of Explosion Products Behind the Shock Wave

V A Popov — — — On the Ionization in the Flame Front
ANISIMOV, V.Ye.

S/076/60/034/05/31/038
B010/B003

AUTHORS: Pokhil, P. F., Mal'tsev, V. M., Gal'perin, L. N.

TITLE: A Device for the Determination of the Temperature From the Height of the Tongue of a Gunpowder Flame

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 5, pp. 1131-1132

TEXT: A device for measuring the temperature within the range 1,300 - 3,000°C is described, in which the height of the flame tongue of gunpowder is determined in dependence on pressure. The determination of the temperature dependence is based on the comparative method of the blue-red coloring which is applied for flames emitting a continuous spectrum in the visible. In the device described the absorptive power is measured along the flame (at certain wavelengths) and, thus, the actual temperature is determined. Simultaneously, the rate of combustion of the gunpowder is determined. The device (Fig. 1, block diagram) contains a collimator, a powerful homogeneous light source (СВД-1000(SVDSh-1000),

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S/076/60/034/011/015/024
B004/B064

11.8100

AUTHORS: Dremin, A. N. and Pokhil, P. F. (Moscow)

TITLE: Investigation of the Zone of Chemical Reaction of Trotyl

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 11, pp. 2561-2570

TEXT: The authors proceed from a paper by Ya. B. Zel'dovich (Ref. 1) according to which the profile of the plane detonation wave has the form shown in Fig. 1. AB is the zone of chemical reaction; a is its width; and BC is the section in which the explosion products fly asunder. This assumption was checked by the authors. The experimental method is based on the fact that the parameters of the shock wave in the metal can be determined by measuring the velocity w of the free surface of metal films of different thicknesses. The calculation is made by means of the diagram $x = f(t)$ shown in Fig. 3. The ordinate is the boundary between metal and explosive. $a = bD(u_1 + c_1 - D_2)/\left[D_2(u_1 + c_1 - \alpha D)\right](1 - \alpha)$ (1) is written. b denotes the thickness of the metal in which the chemical peak is

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B004/B064

Investigation of the Zone of Chemical Reaction of Trotyl

extinguished; D is the rate of detonation; D_2 is the velocity of the shock wave in the metal; u_1 and c_1 are the mass and sonic velocities in the metal at the Jouguet point, $\alpha = \bar{u}/D$, where $\bar{u}$ is the average velocity near the peak. On the basis of the experimental data the experimental equation $a = 0.41/\rho_0^{1.44}$ mm was derived (ρ_0 is the initial density of trotyl, which varied from 1.00 to 1.59 g/cm^3). Accordingly, the value of a was only tenths of a millimeter and by one order of magnitude smaller than the critical diameter d_{cr}. a increases with decreasing ρ_0, and decreases with an increase of pressure. The duration of the chemical reaction of trotyl in detonation is $\sim 10^{-7} - 10^{-8}$ sec. The hydrodynamic theory of detonation suggested by Ya. B. Zel'dovich confirms the detection of a zone of chemical reaction with detonation parameters (pressure and mass velocities) increased as compared to the Jouguet point. A. D. Margolin and V.M.Sosov, collaborators of the authors' institute, calculated the shock adiabate. A. Ya. Apin, L. G. Bolkhovitinov, Yu. N. Ryabinin, Yu. B. Khariton, and L. N. Stesik are mentioned. There are 9 figures, 8 tables, and 10

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Investigation of the Zone of Chemical Reaction of Trotyl

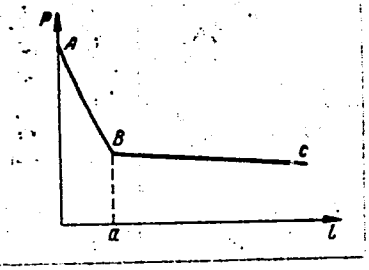
S/076/60/034/011/015/024
B004/B064

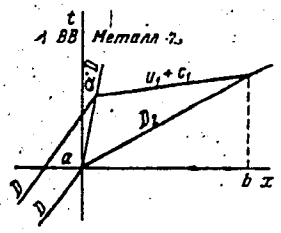
references: 7 Soviet and 3 US.

ASSOCIATION: Akademiya nauk SSSR, Institut khimicheskoy fiziki (Academy of Sciences USSR, Institute of Chemical Physics)

SUBMITTED: March 4, 1959

Legend to Fig. 3: 1: Explosive; 2: Metal.





Card 3/3

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S/020/60/131/04/021/073
B013/B007

AUTHORS: Ilyukhin, V. S., Pokhil, P. F., Rozanov, O. K., Shvedova, N. S.

TITLE: Measurement of Shock Adiabates of Cast Trotyl, Crystalline Hexogen, and Nitromethane

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol 131, Nr 4, pp 793-796 (USSR)

TEXT: The relatively low susceptibility to shock of the substances mentioned in the title makes it possible to determine their Hugoniot curves if no detonation occurs. For this purpose the authors employed the method of detonation. The experimental arrangement is schematically shown in figure 1. By using the conservation laws for mass and momentum in the passage of the substance through the shock wave and by employing the condition of steadiness at the interface between metal and the substance to be investigated it is possible to determine the pressure and volume of shock compression from the measured velocity of the shock wave in the material under consideration, from the velocity of mass in the metal, and from the shock adiabate. In the experiments carried out the authors used 5 mm thick copper plates as intermediate material between the active charge and the substance to be investigated. By measuring the velocity of motion of the free surface of the metal it is possible to determine the velocity of mass behind the front of the shock wave since the velocity of the

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Measurement of Shock Adiabates of Cast Trotyl, Crystalline Hexogen, and Nitromethane

free surface is equal to double the mass velocity (cf Refs 1-3). The velocity of the shock wave in the substance under consideration and the velocity of motion of the free surface of the metal were determined by electric-contact transmitters the signals of which were produced by a cathode-ray oscilloscope of the type OK-15M (developed by the Institut khimicheskoy fiziki AN SSSR (Institute of Chemical Physics of the AS USSR)). The substances mentioned in the title detonate at pressures of between $\sim 80.10^3$ and 100.10^3 atm. For these experiments the authors used 50 mm long and 20 mm thick samples. With rising pressure P of the shock wave entering the sample to be investigated detonation occurs at different distances l from the interface between metal and the explosive under consideration (cf Table 1). This delay of detonation is also used to extend the pressure range to be measured. The velocities of the shock wave measured in all experiments are contained in table 2. From the results obtained in this manner the authors derived empirical relations between the velocity of the shock wave and mass for all substances investigated. The following data were obtained: for hexogen: $D = (2.87+1.61u)$km/sec (valid in the pressure range of from 67.10^9 to 155.10^9 bars); for trotyl: $D = (2.93 + 1.41u)$km/sec (valid in the pressure range of from 60.10^9 to 139.10^9 bars);

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Measurement of Shock Adiabates of Cast Trotyl, Crystalline Hexogen, and Nitromethane

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B013/B007

for nitromethane: $D = (2.00 + 1.38\ u)$ km/sec (valid in the pressure range of from 20.10^9 to 86.10^9 bars). Figure 3 shows the relations between the pressure P behind the front of the shock wave and the relative specific volume V/V_0. The extrapolation of the resulting Hugoniot curves up to the intersection with the Michelson straight carried out on the basis of the last-mentioned relations renders it possible to estimate the pressure at the chemical peak of the detonation wave as well as the ratio between the pressure at the chemical peak and the pressure in the Zhuge plane. Figure 3 shows data obtained by M. Ya. Vasil'yev, D. B. Balashov, and L. N. Mokrousov concerning isothermal static compression of trotyl and hexogen, according to which hexogen is less heated in dynamic compression than trotyl. There are 1 figure, 3 tables, and 6 references, 5 of which are Soviet.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences of the USSR)

PRESENTED: December 9, 1959, by N. N. Semenov, Academician

SUBMITTED: December 9, 1959

Card 3/3

24.5000
11.1000

80010

AUTHORS: Dremin, A. N., Pokhil, P. F., Arifov, M. I.

S/020/60/131/05/044/069
B011/B117

TITLE: Effects of Aluminum on the Detonation Constants of Trotyl

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol 131, Nr 5, pp 1140-1142 (USSR)

TEXT: Based on their results, the authors arrived at the following conclusion concerning the behavior of aluminum in the chemical reaction space of the detonation wave of trotyl: with high-density aluminum charges (of all sizes), this metal is inert in the front of the detonation wave. Aluminum begins to react with decreasing density of the charge. Since thereby lower oxides (AlO and Al_2O) with lower heats of formation (39 kcal/mole for Al_2O as compared to the heat of formation for Al_2O_3 which is 393.1 kcal/mole) form, and oxygen previously bound to other products is consumed, Al has an endothermic effect. Moreover, the composition of the gases is impaired (possibly their quantity is decreased) when aluminum oxides of any type form which must necessarily lead to the reduction of the detonation constants also. A. F. Belyayev (Ref 8) convincingly proved that the efficiency of explosives containing high-molecular explosion products is less than that of substances generating low-molecular explosion products. With a further reduction of the charge density, conditions may arise under which the lower aluminum oxides in the

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Effects of Aluminum on the Detonation Constants of Trotyl

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B011/B117

reaction space are converted to Al_2O_3. This should necessarily lead to an increase of the detonation constants. With high charge densities, these constants are lowered by aluminum of each particle size. For comparison with aluminum, the authors made experiments with admixtures of quartz sand (SiO_2) and tungsten to the trotyl (Table 1). Unexpectedly, the dependence of the detonation velocity of trotyl mixed with fine sand on the charge density (Fig 1) showed a sharp break at a density of 1.54 g/cm^3. Apparently, SiO_2 passes over into another modification. The authors explain the increasing effect of SiO_2 found in their experiments by the increased compressibility. The experimental values obtained for the velocity of motion of the explosion products of trotyl with inert admixtures can be well described by the equation $u = u_0\varrho_0/\varrho_1$ (1), with u_0 being the velocity of explosion products of pure trotyl for a density of the mixed charge ϱ_0, and ϱ_1 the density of the mixture. The velocities of the explosion products measured in the experiments and calculated according to equation (1) are given in table 2. Hence, it follows that the 0.2 μ aluminum

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Effects of Aluminum on the Detonation Constants of Trotyl

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B011/B117

particles with a charge density of 1.49 g/cm^3 have a stronger reducing effect on the characteristics of the detonation wave as compared to the effect exerted by inert admixtures. This proves that aluminum reacts to a different extent according to the size of its particles. The authors disprove the assumption made by S. B. Ratner and Yu. B. Khariton (Ref 4) according to which Al_2O_3 forms in the reaction space which absorbs considerable quantities of heat on evaporation. Al_2O_3 does not exist at all in the vapor phase, but is decomposed to AlO which, in turn, passes over into Al_2O (Ref 5). There are 1 figure, 2 tables, and 8 references, 6 of which are Soviet.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences, USSR)

PRESENTED: November 4, 1959, by N. N. Semenov, Academician

SUBMITTED: November 4, 1959

Card 3/3

S/020/60/132/03/44/066
B011/B011

11.9000
11.1000

AUTHORS: Mal'tsev, V. M., Pokhil, P. F.

TITLE: On the Combustion of a Smoke - Gas Mixture of Gunpowder

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 132, No. 3, pp. 646-648

TEXT: The authors of the present paper deal with the physical properties of the gunpowder flame. The experimental part of the investigation was conducted with a system deviced at the authors' institute (Ref. 1). The authors measured the absorbability of the flame, in order to estimate the weight concentration of the smoke - gas mixture. Absorbability was examined at every 0.1 mm of the flame height at the following wavelengths: 4050, 4950, 6700, and 7710 A (interference filter). A sample 7 mm in diameter of nitroglycerin powder with an armored surface was placed into a cylinder with constant pressure and ignited from the front. The flame was transluced by a strong xenon bulb. The authors subdivide the flame at 20-50 atm into 3 vertical zones: I. from the powder surface to point K_o (the point K_o has a minimum in absorbability); II. from K_o to K_1 (beginning from K_1 the

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On the Combustion of a Smoke - Gas Mixture of Gunpowder

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B011/B011

absorbability assumes a constant value); III. the zone of maximum temperature. A decrease in the absorbability of the flame with rising wavelength as well as a diminution in the geometric dimensions with rising pressure are characteristic of all of the three zones. The flame absorbability a_λ is determined from formula: $a_\lambda = \frac{A_k^o - A_k'}{A_k^o}$, where A_k' is the amplitude of the light current emanating from the xenon bulb in the presence of the flame and A_k^o is the calibration amplitude of the light current, if there is no flame on the way of the light current to the collimator slit. Depending on the height of the tongue of flame α, the weight concentration of the smoke - gas mixture is related to a_λ in the following manner: $\alpha = \frac{\ln (1 - a_\lambda)}{l}$, where l is the length of the light ray path. The authors derive a formula for the value of the aerosol particles of mixture K_λ and prove that $\alpha = \frac{B}{\rho_n} q$, where q denotes the weight concentration and ρ_n is the gunpowder density. $B = \frac{36\pi n K_\lambda}{(m^2+2)\lambda}$, where n is the refractive index

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81407

S/020/60/132/06/32/068
B004/B005

11.8000

AUTHORS: Zaytsev, V. M., Pokhil, P. F., Shvedov, K. K.

TITLE: Electromagnetic Method of Measuring the Speed of Explosion Products

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 132, No. 6, pp. 1339-1340

TEXT: In contrast to the calculation of the exponent of the Poisson adiabatic curve of the explosion products carried out in Refs. 1, 2, the authors applied the direct measurement of the speed of the explosion products; a copper- or aluminum foil, 0.3-0.5 mm thick, was moved through the explosion products in an electromagnetic field, and the emf recorded by means of an OK-17M (OK-17M) cathode-ray oscilloscope. Fig. 1 shows the experimental apparatus in which the magnetic field was generated by means of direct current in two halves of the coil winding distant from each other by the coil radius, according to a suggestion by B. K. Shembel'. Fig. 2 shows an oscillogram from which the speed of the explosion products was calculated by extrapolation for the beginning of the foil movement.

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APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341620005-9"

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Electromagnetic Method of Measuring the Speed of Explosion Products

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B004/B005

The explosives used were trotyl and the melt TG 50/50 (TG 50/50) of equal parts by weight of trotyl and Hexogen. Table 1 indicates the experimental data. The oscillograms obtained show that the mass velocity decreases linearly in the first period. This leads to the conclusion that the exponent of Poisson's adiabatic curve not only depends on the initial density but remains constant for about 3 - 3.5 μsec. There are 2 figures, 1 table, and 6 references: 5 Soviet, and 1 English.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences, USSR)

PRESENTED: February 20, 1960, by V. N. Kondrat'yev, Academician

SUBMITTED: February 20, 1960

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S/020/60/133/01/43/070
B004/B007

AUTHORS: Zaytsev, V. M., Pokhil, P. F., Shvedov, K. K.

TITLE: Measurement of the Velocity of Sound in Detonation Products

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 133, No. 1, pp. 155 - 157

TEXT: The authors describe a method of measuring the velocity of sound in detonation products of explosives, which consists in the detonation wave being reflected from an inert substance (paraffin). The reflected wave propagates in the detonation products with the velocity of sound, and is recorded by an oscilloscope. Fig. 1 shows the scheme of the experimental setup and an oscillogram. By means of the equation $c = S(D - \bar{u})/(Dt - S)$ the average velocity of sound was calculated for a time interval τ (S = distance between the explosive and the inert substance, D = velocity of the detonation front, u = velocity of the detonation products, c = velocity of the reflected wave). The results obtained for trotyl and TG 50/50 (TG 50/50 = 50 % trotyl + 50 % trimethylenetrinitroamine) are shown in Fig. 2 and Table 1. By using the phase equation suggested by

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S/020/60/135/004/034/037
B016/B066

11.7200

AUTHORS: Pokhil, P. F., Mal'tsev, V. M., and Lukashenya, G. V.

TITLE: Burning of Ballistic Powders

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 135, No. 4, pp. 913-916

TEXT: The purpose of the present paper was: a) to devise optical methods of measuring the temperature in the entire height of the powder flame, and b) to study the dependence of the temperature profile on the pressure. Fig. 1 shows a block diagram of the applied device by means of which reliable values are obtained above 600-700°C. The construction of the bomb 1 was described in a previous paper (Ref. 3) A radiation flux passes a quartz window and is concentrated by the quartz lens 7 upon the slit which cuts out continuously a narrow (40μ) surface section of the flame in true scale. Both a quick and a slow change in temperature is reproduced by means of a current amplifier with carrier frequency (5 kc/sec), in that the radiation flux is subjected to an adequate obturation. In this way a moderated radiation flux gets into the radiation receiver 4 (with

Card 1/3

89028

Burning of Ballistic Powders

S/020/60/135/004/034/037
B016/B066

conductivity ($\sim 5 \cdot 10^{-4}$ cal/cm.sec.degree); u - rate of the powder combustion; ρ - density of the powder (~ 1.6 g/cm^3); $\bar{c}$ - mean value of the specific heat capacity of the burning products (~ 0.4 cal/g·degree); q(x) - rate of heat evolution from the chemical reactions. Fig. 4 shows the heat evolution (cal/cm^3·sec) as a function of the height h at 60 atm. The authors conclude from the resultant data that for heating the powder mainly this heat is used that is formed by decomposition of the condensed phase, i.e. this heat that forms in the reaction layer of the condensed phase of the powder charge and the heat resulting from the decomposition reactions of the aerosol particles of the smoke. There are 3 figures and 5 references: 4 Soviet and 1 US.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences USSR)

PRESENTED: June 23, 1960, by V. N. Kondrat'yev, Academician

SUBMITTED: April 2, 1960

Card 3/3

24023
S/076/61/035/005/007/C08
B101/B218

11.7200

AUTHORS: Pokrif (F. P.), Maltser, V. M., and Lukashenya, G. V. (Moscow)

TITLE: Apparatus for measuring the temperature profile of the tongue of a gunpowder flame

PERIODICAL: Zhurnal fizicheskoy khimii, v. 35, no. 5, 1961, 1142-1143

TEXT: The authors describe an apparatus for measuring absorption along the tongue of a flame in a certain spectral region for the purpose of determining the actual temperature of the flame. Fig. 1 shows the block diagram. 1 is the bomb in which the powder 2 burns. It withstands pressures of up to 150 atm. 3 is the optical system; 4 and 4' are rotating choppers for modulating the light, which are operated by synchronous motors of the types GA-09M (SD-09M) 9, 10; 5 are filters; 6 is a preamplifier with a PbS photoconductive cell, 7 an amplifier, 8 a loop oscilloscope of the type MPO-2 (MPO-2), 11 an optical system for determining the absorption along the height of the tongue of the flame, 12 a calibrated tungsten lamp, and 13 a thermostat for PbS. The powder is put into the bomb filled with nitrogen and inflamed at one end by means of an electric spiral. The radiation of

Card 1/3

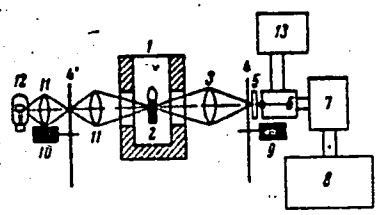
24023
S/076/61/035/005/007/008
B101/B218

Apparatus for measuring the temperature...

ASSOCIATION: Akademiya nauk SSSR, Institut khimicheskoy fiziki (Academy of Sciences, USSR, Institute of Chemical Physics)

SUBMITTED: September 24, 1960

Fig. 1: Schematic representation of the apparatus (explanation in the text).



Card 3/3

27884
S/020/61/140/001/024/024
B130/B101

14 8300

AUTHORS: Ilyukhin V. S., and Pokhil P. F.

TITLE: Shock-wave sensitivity of some explosives

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 140, no. 1, 1961, 179-180

TEXT: The shock-wave sensitivity of explosives was determined by transferring the detonation from an active to a passive explosive with interposition of copper barriers. The distance (ℓ) from the interface "metal - passive explosive" to the initial point of detonation was determined by photographing the detonation transfer with an СФР(SFR) camera. TNT, hexogen, and ТГ 50/50 (TG 50/50) of different densities were used as active explosives. The charge length was 100 mm, and the diameter 40 mm. The length of the passive explosive was 50 mm, and its diameter 20-30 mm. The thickness of the copper barrier varied from 5 to 30 mm. The minimum (critical) pressures of the front of the initiating shock wave corresponding to a maximum detonation delay are shown in Table 1. The test explosive is heated by the initiating shock wave to a temperature

Card 1/2

Shock-wave sensitivity of some ...

ensuring a short ignition delay and a rapid chemical decomposition. The difference in sensitivity between the first six and the remaining explosives is explained by the different mechanisms of heating. Explosives of lower sensitivity and homogeneous, compact structure explode as soon as the entire substance is heated. This necessitates a strong initiating pulse. Granulated substances, however, are ignited on the surface of the grains, where the highest heating temperature is reached. The values of p_{crit} are not absolute. They can be reduced to one-half by increasing the dimensions of the active and the passive explosive correspondingly. In explosives ignited according to a ballistic mechanism, p_{crit} is a function of grain size, initial density, composition, etc. There are 1 table and 6 references: 4 Soviet and 2 non-Soviet. The reference to English-language publication reads as follows: W. B. Garn, J. Chem. Phys., 30, No. 3, 819 (1959).

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences USSR)

S/076/62/036/006/006/011
B124/B110

11.2110

AUTHORS: Pokhil, P. F., Romodanova, L. D., and Rysakova-Romashkan, O. P.

TITLE: Combustion of binary model oxidant - fuel mixtures

PERIODICAL: Zhurnal fizicheskoy khimii, v. 36, no. 6, 1962, 1331-1332

TEXT: Pressed specimens (ρ = 1.9-2.0) were examined at a pressure of approximately 10^{-2} mm Hg in order to study the combustion of the stoichiometric mixtures $KClO_4$ - naphthalene (I) and $KClO_4$ - starch (II). At this pressure, the mixture (II) becomes self-igniting and burns without flame on heating to 560°C. Approximately 120 cal/g heat was emitted during decomposition in the reactive layer of the condensed phase. When the mixture (II) was heated in vacuo to 560°C, it formed 100-110 cm^3 gaseous products per g of mixture and about 65% smoke which burned in the air on ignition. A liquid phase formed at the surfaces of the two mixtures studied. The surface temperature was approximately 640°C in mixture II.

Card 1/2

POKHIL, P. F.; ROMADANOVA, L. D.

"The investigation of the combustion surface structure of model solid-fuel mixtures."

report submitted for 2nd All-Union Conf on Heat & Mass Transfer, Minsk, 4-12 May 1964.

Inst of Chemical Physics, AS USSR.

L 30008-65 EWG(j)/EPA/EWP(e)/EPA(s)-2/EWT(m)/EPF(c)/EPR/EWP(j)/EWP(b)/EWA(c) Pc-4/
ACCESSION NR: AP5006688 Paa-4/Pr-4/Ps-4/ S/0076/65/039/002/0294/0299 Pt-10
WW/JWD/RM/WH

64
63
B

AUTHOR: Pokhil, P. F. (Moscow); Romodanova, L. D. (Moscow)

TITLE: Investigation of the structure of the surface of burning model mixtures of solid fuels

SOURCE: Zhurnal fizicheskoy khimii, v. 39, no. 2, 1965, 294-299

TOPIC TAGS: oxidant, solid combustible, combustion mechanism, ammonium perchlorate, sodium perchlorate, potassium perchlorate, tungsten, graphite, naphthalene

ABSTRACT: To study the mechanism of combustion of solids, charges of stoichiometric mixtures of oxidants (ammonium perchlorate, potassium perchlorate, and sodium perchlorate) with combustibles (graphite, tungsten, naphthalene, starch, and succinic and malonic acids) were ignited and burned for various periods of time under various conditions (in vacuo, under pressure, and in air). They were then extinguished, and their surfaces were investigated under a microscope. Analysis of the tabulated results showed that with the exception of the ammonium perchlorate-tungsten mixture, none of the mixtures with

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L 30008-65
ACCESSION NR: AP5006688 O

ammonium perchlorate burn steadily at room temperature in vacuo (10^{-2} mm Hg). The burning ceases when the igniting wire is removed from the charge surface. During the application of the hot wire, the combustible materials (except W) melt, and ammonium perchlorate crystals appear on the charge surface. At pressures above atmospheric, the amount of ammonium perchlorate crystals on the burning surface decreases, and at pressures above 30 atm, the crystals are replaced by holes, which is attributed to the burning of ammonium perchlorate itself at pressures above 30 atm. Depending on the melting or sublimation temperature, either the oxidant or the combustible accumulates on the burning surface. The appearance of small bubbles in the molten layer of the burning mixture indicates a liquid-phase oxidation process. The limiting pressure at which the mixtures containing ammonium perchlorate cease to burn depends on the particle size of the oxidant and on the physical properties of the combustible. Stable combustion was observed for $KClO_4$-W mixtures at temperatures exceeding 5C and pressures of about 10^{-2} mm Hg. The NH_4ClO_4-W mixture also burned steadily at room temperature and pressures of 5 atm or more. Mixtures of these oxidants with graphite do not burn steadily in the pressure region studied (up to 100 atm). The initial stage of burning of

Card 2/3

L 30008-65
ACCESSION NR: AP5006688

solids occurs in the molten layer of the charge, and a high-temperature gaseous phase is formed where the burning is completed. Orig. art. has: 2 figures and 1 table. [PS]

ASSOCIATION: Akademiya nauk SSSR, Institut khimicheskoy fiziki (Academy of Sciences SSSR, Institute of Chemical Physics)

SUBMITTED: 09Mar63 ENCL: 00 SUB CODE: FP

NO REF SOV: 004 OTHER: 001 ATD PRESS: 3196

Card 3/3

L 36301-65 EWT(d)/EWT(l)/EPF(c)/EPF(n)-2/EWA(d)/EWP(v)/EWP(k)/EWP(h)/EWP(l) 42
Pf-4/Pr-4/Pu-4 IJP(c) WW

ACCESSION NR: AP5008920 S/0076/65/039/003/0788/0789 41 43

AUTHOR: Pokhil, P. F. (Moscow); Mal'tsev, V. M. (Moscow); Seleznev, V. A. (Moscow)

TITLE: Temperature nonuniformities in the flame of condensed systems

SOURCE: Zhurnal fizicheskoy khimii, v. 39, no. 3, 1965, 788-789

TOPIC TAGS: temperature measurement, spectral brightness method, flame temperature, gun powder

ABSTRACT: A spectral brightness method is described for measuring temperature nonuniformity in the flame of condensed systems (gun powder) in the temperature range of 1300—3600K. The proposed method is based on the measurement of the absorption of light by the flame in a special apparatus. The apparatus (see Fig. 1 of the Enclosure) consists of a high-pressure (150 atm) bomb, 1; a motion picture camera, 2; a tungsten-band lamp for calibrating the optical system, 3; optical obturators, 4 and 5; a xenon lamp, 6; a spectrograph, 7; a photoelectric unit, 8; an electronic unit, 9; and an oscillograph, 10. Experiments with the gun powder flame showed that along the flame cross section the temperature is constant. The frequency of the flame temperature nonuniformity determined for the ballistic powder under certain conditions by this method was about 30 msec. The amplitude

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L 36301-65

ACCESSION NR: AP5008920

of the temperature nonuniformity along the height of the flame decreased as it neared the maximum temperature zone. The temperature nonuniformities may be caused by physical and chemical nonuniformities of the fuel, by large particles entering the flame from the three-phase dispersed system (solid-liquid-gas) formed on the charge surface, and by turbulence in the flow. Orig. art. has: 1 figure. [PS]

ASSOCIATION: Akademiya nauk SSSR, Institut khimicheskoy fiziki (Institute of Chemical Physics, Academy of Sciences, SSSR)

SUBMITTED: 23Jul63 ENCL: 01 SUB CODE: FP

NO REF SOV: 003 OTHER: 000 ATD PRESS: 3220

Card 2/3

L 36301-65
ACCESSION NR: AP5008920 ENCLOSURE: 01

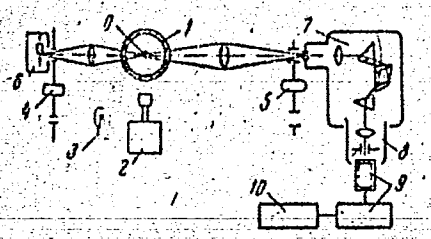

Fig. 1 Diagram of apparatus for measuring temperature nonuniformity in the flame

Card 3/3

FOKHIL, P.F.; MAL'TSEV, V.M.

Combustion temperature of explosives. Zhur. fiz. khim. 39 no.4: 978-979 Ap '65. (MIRA 19:1)

1. Institut khimicheskoy fiziki AN SSSR. Submitted July 23, 1963.

POKHIL, P.F.; ROMODANOVA, L.D.

Combustion of compositions based on potassium perchlorate oxidizer and metallic fuels in vacuo. Zhur.fiz.khim. 39 no.11:2757-2759 N '65. (MIRA 18:12)

1. Institut khimicheskoy fiziki AN SSSR.

L 21852-66 EWP(m)/EWA(h)/EWP(j)/EWT(l)/EWT(m)/EWA(d)/EWA(l) RM/WW/JW

ACC NR: AP6011507 SOURCE CODE: UR/0414/65/000/004/0083/0084

AUTHOR: Kiselev, Ye. Ye. (Moscow); Margolin, A. D. (Moscow); Pokhil, P. F. (Moscow)

ORG: none

TITLE: Shock-wave ignition of gun powder

73

B

SOURCE: Fizika goreniya i vzryva, no. 4, 1965, 83-84

TOPIC TAGS: gun powder, nitroglycerin, nitrocellulose, shock wave ignition

ABSTRACT: Ignition of nitroglycerin and nitrocellulose powder by a shock wave was studied in a shock tube 4.7 m long and 41 mm in diameter. The tube was divided by a copper diaphragm into a low-pressure chamber filled with air and a high-pressure chamber filled with compressed nitrogen. The pressure in the shock wave was 3—25 atm and temperature was 500—1500K. The ignition delay decreased as the pressure and gas temperature in the reflected shock wave increased. At a gas temperature of about 1000K, the ignition occurred within milliseconds. The effect of the powder surface temperature and the surface structure on the ignition process was discussed. It was suggested that charges with rough surfaces ignite at much lower surface temperatures than charges with smooth surfaces. This was proven by experiments with specially prepared smooth-surface charges. The surface of the nitroglycerin and nitrocellulose powder was moistened with acetone and pressed against a glass plate. After several days, the powder charge was separated and ignited in the shock tube. Under the same

Card 1/2

UDC: 536.46+532.593

L 21852-66

ACC NR: AP6011507

conditions, the smooth-surface charges did not ignite even at temperatures 200—300K higher than the ignition temperature of charges with the usual rough surface; however, a small scratch on the smooth surface leads to ingition of the charges. Thus, the ignition of powder charges is greatly dependent on the state of the charge surface. Microprotrusions on the surface are heated much faster than the whole surface and decrease considerably the surface temperature at which the ignition occurs. Orig. art. has: 1 formula. [PS]

SUB CODE: 19, 21/ SUBM DATE: 06Aug65/ ORIG REF: 002/ OTH REF: 001/ ATD PRESS: 4227

Card 2/2 nat

L 46781-66 EWT(m)/EWP(j)/T/EWP(e) RM/WH/WW JW/JWD/GS

ACC NR: AT6031999 SOURCE CODE: UR/0000/66/000/000/0183/0190

AUTHOR: Pokhil, P. F.; Romodanova, L. D.

ORG: Institute of Chemical Physics, AN SSSR, Moscow (Institut khimicheskoy fiziki AN SSSR)

TITLE: A study of the structure of the burning surface of composite solid propellants

SOURCE: Teplo-i massoperenos, t. 4: Teplo- i massoobmen pri khimicheskikh prevrashcheniyakh v tekhnologii (Heat and mass transfer, v. 4: Heat and mass transfer during chemical transformations). Minsk, Nauka i tekhnika, 1966, 183-190

TOPIC TAGS: combustion, solid propellant, composite propellant, solid propellant combustion, combustion mechanism

ABSTRACT: A study was made of the surface structure of burning solid propellants containing $KClO_4$, NH_4ClO_4, or $NaClO_4$ as oxidizers and tungsten, graphite, naphthaline, starch, or succinic or malonic acid as fuels. The surface structure was studied by means of a microscope with 10—80x magnification. The study showed that in a mixture of a nonmelting oxidizer (NH_4ClO_4) with a melting or decomposing fuel, the NH_4ClO_4 crystals protrude above the surface at pressures lower than 30 atm abs. At pressures exceeding 30 atm abs indentations were observed at the points where the protrusions had been located at a lower pressure. Thermally stable fuels such as graphite and tungsten tend to concentrate on the surface. When evaporation or

Card 1/2

L 46781-66

ACC NR: AT6031999

decomposition temperature of the oxidizer is higher than that of the fuel (naphthaline), the concentration of the oxidizer on the surface increases. In the oxidizer or fuel melt on the propellant surface, small bubbles generated by the decomposition of the fuel and oxidizer and by liquid-phase oxidation of the fuel were observed. The pressure limit of a NH_4ClO_4-fuel mixture below which the fuel does not undergo stable combustion depends on the particle size of the NH_4ClO_4 and the physical properties of the fuel. $KClO_4$-W mixtures underwent stable combustion at 10^{-2} mm Hg at a temperature ≥5C. At a pressure ≥5 atm a NH_4ClO_4-W mixture burns at room temperature. $KClO_4$- graphite and NH_4ClO_4-graphite did not undergo stable combustion in the entire pressure range up to 100 atm. It was also shown that the first stage of the combustion process takes place in the melt of the condensed phase or on the surface of the thermally stable fuels (graphite, W) and is accompanied by heat release. Orig. art. has: 2 figures. [PV]

SUB CODE: 21/ SUBM DATE: 25Apr66/ ORIG REF: 004/ OTH REF: 001/ ATD PRESS: 5090

hs

Card 2/2

L 46316-66 EWT(d)/EWT(l)/EWT(m)/T IJP(c) WW/JW/JWD

ACC NR: AP6027959 SOURCE CODE: UR/0020/66/169/003/0619/0621

AUTHOR: Zenin, A. A.; Leypunskiy, O. I.; Margolin, A. D.; Nefedova, O. I.; Pokhil, P. F.

ORG: Institute of Chemical Physics, Academy of Sciences, SSSR (Institut khimicheskoy fiziki Akademii nauk SSSR)

TITLE: Temperature field at the surface of burning gunpowder and combustion stability

SOURCE: AN SSSR. Doklady, v. 169, no. 3, 1966, 619-621

TOPIC TAGS: gunpowder, combustion stability, temperature field, ~~stability criterion~~ temperature distribution

ABSTRACT: Temperature distribution at the surface of burning gunpowder H was measured at initial surface temperatures ranging from -196 to 140C and pressures of 1—20 atm. The experimental data were used to determine the values of combustion stability criteria for various temperatures and pressures. Comparison of the experimental results with published theories showed that the Zel'dovich stability criterion (ZhETF, 12, 498, 1942), which was derived on the assumption that the temperature of the powder surface does not change with changing burning velocity and that there is no heat release in the condensed phase, is

Card 1/2 UDC: 541.126+536.462

L 46316-66

ACC NR: AP6027959

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valid only at low temperatures. The criterion derived by Istratov and Librovich (Zhurn. prikl. mekh. i tekhn. fiz., No. 5, 38, 1964) and the criterion derived by Novozhilov (ZhPMTF, No. 4, 157, 1965) are valid over the entire temperature range studied. Orig. art. has: 4 tables. [PS]

SUB CODE: 21/ SUBM DATE: 15Nov65/ ORIG REF: 010/ ATD PRESS: 5154

Card 2/2 egh

ACC NR: AP5028583 EWP(e)/EPA(s)-2/EWT(m)/EPF(c)/ETC/EPF(n)-2/EWG(m)/EWP(t)/EWP(k)/EWP(z)/EWP(b)/EWA(c) IJP(c)/RPL JD/WW/JW/JG/JWD SOURCE CODE: UR/0076/65/039/011/2757/2759

AUTHOR: Pokhil, P. F.; Romodanova, L. D.

ORG: Institute of Chemical Physics, Academy of Sciences, SSSR (Institut khimicheskoy fiziki Akademiya nauk SSSR)

TITLE: The combustion of systems containing potassium perchlorate as oxidizer and metal fuels in vacuum

SOURCE: Zhurnal fizicheskoy khimii, v. 39, no. 11, 1965, 2757-2759

TOPIC TAGS: solid propellant, propellant, combustion metallized fuel, metal additive, Zr, Mo, W, Ti, combustion stability

ABSTRACT: Previous studies by the authors showed that composite propellants containing potassium perchlorate and a metal as fuel can undergo flameless combustion at 10^{-2} mm Hg pressure. Since the combustion stability of such propellants depends on the condensed phase reaction and the overall heat release, a study was made of the ignition temperatures, the surface temperatures during combustion, the burning velocities and the chemical composition of the condensed- and gas-phases of propellants containing $KClO_4$ and Mo, Zr, W, or Ti with particle sizes ranging from 20 to 60 μ. The ignition temperatures ranged from 370C for $KClO_4$ + Mo to 610C for $KClO_4$ + Ti, while the surface temperatures of these propellants were 610 and 640C, respectively. This indicates that after ignition, the surface temperature increases due to the exothermal reaction in the condensed phase. Chemical analysis of the condensed and gas

Card 1/2 UDC: 541.126

L 6966-66

ACC NR: AP5028583

phases during combustion of $KClO_4$ + Zr showed that only 7% of oxide is formed, but 30% $KClO_4$ decomposes in the condensed phase. This shows that in the initial combustion stage, the reaction takes place only on the metal surface, then a gas-smoke phase is formed in which combustion is completed. Another important conclusion is that ignition takes place at a temperature at which the metal is solid. Orig. art. has: 4 tables.

[PV]

SUB CODE: FP/ SUBM DATE: 13Oct64/ ORIG REF: 002/ ATD PRESS: 4143

Metal Powder

Card 2/2

POKHIL, P.F.; VOLPYANSKIY, A.Ye.; MAL'TSEV, V.M.; LOGACHEV, V.S.; SELEZNEV, V.A.

Sapphire light conductor for measurement of energy radiated from the flame torch zone toward the burning surface of a powder charge . Zhur. fiz. khim. 39 no.5:1281-1282 My '65.
(MIRA 18:8)

1. Institut khimicheskoy fiziki AN SSSR.

POKHIL, P.F.; MAL'TSEV, V.M.; SELEZNEV, V.A.

Temperature inhomogeneities in the tongue of flame in condensed systems. Zhur. fiz. khim. 39 no.3:788-789 Mr '65. (MIRA 18:7)

1. Institut khimicheskoy fiziki AN SSSR.

POKHIL, P.F.; ROMODANOVA, L.D.

Structure of the surface of combustion of model solid fuel mixtures. Zhur. fiz. khim. 39 no.2:294-299 F '65. (MIRA 18:4)

1. Institut khimicheskoy fiziki AN SSSR.

Ps-4 RPL WW/JW/JWD/RM

ACCESSION NR: AP5011470 UR/0076/65/039/004/0978/0979

AUTHOR: Pokhil, P. F.; Mal'tsev, V. M.

TITLE: Temperature of burning of explosives

SOURCE: Zhurnal fizicheskoy khimii, v. 39, no. 4, 1965, 978-979

TOPIC TAGS: flame temperature, explosive, PETN, hexogen, tetryl, pressure bomb

ABSTRACT: The temperatures of burning of PETN, hexogen, and tetryl were measured at high pressures (20—100 atm) in a constant-pressure bomb in a nitrogen atmosphere. A previously described experimental unit was used (P. F. Pokhil, V. M. Mal'tsev, and L. I. Gal'perin, Zh. fiz. khimii, v. 34, 1131, 1960). The flame absorption abilities of PETN and hexogen were in the range of 0.1—0.3 and that of tetryl in the range of 0.8—0.9. In all cases, the absorption ability increased along the flame height towards the charge surface. The temperature of the flames of PETN and hexogen in the pressure range of 20—60 atm increased rapidly; in the pressure range of 60—100 atm the temperature rose slowly to a maximum of 3250 and 3150K, respectively. In this pressure range (20—100 atm), the tetryl flame temperature changed only slightly and was 2600K. In all cases the measured temperatures were lower than calculated. At high pressures, the explosives were partially dispersed at the surface of the liquid layer of the charges. Orig. art. has: 1 figure. [V.]

Card 1/2

L 44176-65

ACCESSION NR: AP5011470

ASSOCIATION: Akademiya nauk SSSR. Institut khimicheskoy fiziki (Academy of Sciences, SSSR. Institute of Chemical Physics)

SUBMITTED: 23Jul63 ENCL: 00 SUB CODE: FP, TD

NO REF SOV: 004 OTHER: 000 ATD PRESS: 3241

Card 2/2

FOKHIL, P.F.; ROMODANOVA, L.P.; [illegible]VA-ROMASHKAN, O.I.

Process of combustion of model two-component oxidizing agent -- fuel mixtures. Zhur. fiz. khim. 36 no.6:1331-1332 Je '62 (MIRA 17:7)

1. Institut khimicheskoy fiziki AN SSSR.

MARGOLIN, A.D.; NEFEDOVA, O.I.; POKHIL, P.F. (Moskva)

Dependence of the burning velocity of various fuel systems on the initial temperature. PMTF no.3:149-153 My-Je '64.
(MIRA 17:6)

POKHIL, P.F.; MAL'TSEV, V.M.

Mechanism underlying the burning of powder. Inzh.-fiz. zhur. 6 no.6:94-99 Je '63. (MIRA 16:6)

1. Institut khimicheskoy fiziki AN SSSR, Moskva.
(Gunpowder, Smokeless) (Combustion)

MAL'TSEV, V.M. (Moskva); POKHIL, P.F. (Moskva)

Estimation of the thermal effect of the initial stage of the burning of powders and other explosives. PMTF no.2:173-174 Mr-Ap '63. (MIRA 16:6)

(Explosions)

MARGOLIN, A.D.; POKHIL, P.F.

Effect of pressure on the rate of the processes taking place in the reaction layer of the condensed phase of burning powder. Dokl. AN SSSR 150 no.6:1304-1306 Je '63. (MIRA 16:8)

1. Institut khimicheskoy fiziki AN SSSR. Predstavleno akademikom V.N.Kondrat'yevym.

(Gunpowder) (Combustion)

ACCESSION NR: AP4041205 S/0207/64/000/003/0149/0153

AUTHORS: Margolin, A. D. (Moscow); Nefedova, O. I. (Moscow); Pokhil, P. F. (Moscow)

TITLE: Dependence of burning rate of different fuels on initial temperature

SOURCE: Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, no. 3, 1964, 149-153

TOPIC TAGS: burning rate, fuel, hexogene, perchlorate, benzoate, reaction layer

ABSTRACT: Experiments were made with hexogene and mixtures of potassium perchlorate with tungsten, zirconium, or potassium benzoate. Initial temperatures ranged from -140 to 150C. The component ratios, charge densities, and inert-gas pressure were varied in the experiments. It was found that the log of the burning rate of hexogene and mixtures of potassium perchlorate with metals has a linear dependence on initial temperature of the substance, but the relation for mixtures of potassium perchlorate with potassium benzoate has a break in it. Measurements of the surface temperatures in flameless combustion showed that the heat given off in the reaction layer of the condensed phase, on raising the initial temperature of the pyroxylin powder from 90 to 140C, decreases 15% (from

Card 1/2

ACCESSION NR: AP4041205

84 to 72 cal/g). The heat capacity of the products that form the smoke-gas mixture and the powder is computed to be 0.4 cal/g deg. "The authors thank N. N. Mikhaylov for designing and preparing the attachments for cooling the samples." Orig. art. has: 6 figures and 2 tables.

ASSOCIATION: none

SUBMITTED: 23Nov63 ATD PRESS: 3079 ENCL: 00

SUB CODE: FP NO REF SOV: 008 OTHER: 000

Card 2/2

L 14545-63 EPF(c)/EWT(m)/BDS AEDC/AFFTC/APGC/RPL Pr-4 BW/WW/JW/
JWD/H

ACCESSION NR: AP3003228 S/0020/63/150/006/1304/1306

66
64

AUTHOR: Margolin, A. D.; Pokhil, P. F.

TITLE: The effect of pressure on the rate of processes in the reaction layer of the condensed phase of burning gunpowder

SOURCE: AN SSSR. Doklady*, v. 150, no. 6, 1963, 1304-1306

TOPIC TAGS: pressure, burning gunpowder, powder combustion rate, condensed phase

ABSTRACT: Since the processes occurring in the reaction layer of the condensed phase in some cases contributed 0.9 q (q = total amount of heat required for heating this phase), these processes may be one of the major determinants, if not the principal one, of the powder combustion rate. One of the many factors determining the combustion rate of gaseous mixtures and of gunpowder - where the main stage of combustion starts in the gaseous phase - is pressure. It affects the rate and kinetics of chemical reactions involving the dissolved gaseous substances given off on dissociation of the condensed phase, the temperature equilibrium and phase shifts, and the surface temperature of the condensed phase.

Card 1/2

L 14545-63

ACCESSION NR: AP3003228

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Increasing the pressure increases the solubility of the gaseous products and impedes dispersion. The mechanism by which pressure affects dispersion and hence combustion rate is described by a series of equations. In real systems, however, where substances with very different solubilities are present in the condensed phase, the relationship between combustion rate and pressure may be more complex. Still, while the many and diverse chemical and physical processes going on in the reaction layer of the condensed phase are the major factors determining combustion rate, the rate may nonetheless depend on the pressure. This report was presented by Academician V. N. Kondrat'yev, 21 Feb 63. Orig. art. has: 10 equations.

ASSOCIATION: Institut khimicheskoi fiziki Akademii nauk SSSR (Institute of Chemical Physics, Academy of Sciences SSSR)

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ACCESSION NR: AP3003052 S/0170/63/000/006/0094/0099

AUTHOR: Pokhil, P. F.; Mal'tsev, V. M.

TITLE: Combustion mechanism of powders

SOURCE: Inzhenerno-fizicheskiy zhurnal, no. 6, 1963, 94-99

TOPIC TAGS: combustion mechanism, nitroglycerine powder, hexogen, temperature measurement, infrared pyrometer

ABSTRACT: The distribution of light absorption and temperature along the axis of flames of nitroglycerine powder (ballistite H) and hexogen at pressures of $(220.5--440.1)\cdot10^4$ newton/m^2 were measured in a constant-pressure bomb by an infrared pyrometer originally developed for temperature measurements at 600--3500°K. Three distinct zones were distinguished on the curves of temperature and absorption versus distance for the powder. Absorption decreased to a minimum in the first zone and increased in the second. In the third zone the

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